NO80-630 ERIC REPORT RESUME

ED 010 007 8-31-66 24 (REV)

A STUDY OF EFFECTIVENESS OF DIFFERENT METHODS OF TEACHING INTERNATIONAL RELATIONS TO HIGH SCHOOL STUDENTS, FINAL REPORT.

GARVEY, DALE M. * SEILER, WILLIAM H.
HVL27028 KANSAS STATE TEACHERS COLL., EMPORIA

CRP-S-270
28-FEB-66
EDRS PRICE MF-$0.27 HC-$6.48 162P.

*AMERICAN GOVERNMENT (COURSE), *TWELFTH GRADE, *SIMULATION, *TEACHING TECHNIQUES, *LECTURE, *DISCUSSION (TEACHING TECHNIQUE), EXPERIMENTAL GROUP, CONTROL GROUP, COMPARATIVE ANALYSIS, STUDENTS, HIGH SCHOOL STUDENTS, KANSAS, TOPEKA, LAWRENCE, EMPORIA

IT WAS HYPOTHESIZED THAT SIMULATION AS AN INSTRUCTIONAL TECHNIQUE WOULD PRODUCE RESULTS SIGNIFICANTLY BETTER THAN THOSE OBTAINED IN CLASS GROUPINGS WHICH EMPLOYED ONLY LECTURE-DISCUSSION METHODS. FOUR HUNDRED AND FIVE 12TH-GRADE AMERICAN GOVERNMENT STUDENTS IN 2 HIGH SCHOOLS IN KANSAS WERE THE SUBJECTS. FIVE CLASSES, 225 STUDENTS, CONSTITUTED THE EXPERIMENTAL GROUP WHICH EMPLOYED SIMULATION. THE OTHER 180 STUDENTS CONSTITUTED THE CONTROL GROUP AND HAD INSTRUCTION SIMILAR IN EVERY RESPECT TO THAT RECEIVED BY THE EXPERIMENTAL GROUP EXCEPT THAT SIMULATION PERIODS WERE REPLACED BY LECTURES AND DISCUSSIONS. THE SAME TWO TEACHERS AT EACH HIGH SCHOOL TAUGHT THEIR RESPECTIVE EXPERIMENTAL CLASSES AND CONTROL CLASSES, AND BOTH HAD PREVIOUS EXPERIENCE IN THE USE OF SIMULATION AND CUSTOMARILY TAUGHT THE SUBJECT. DATA WERE ACQUIRED FROM THREE PHASES OF TESTING--(1) AT INTRODUCTION OF INSTRUCTION IN INTERNATIONAL RELATIONS, (2) AT CONCLUSION OF 6-WEEK UNIT OF INSTRUCTION, AND (3) APPROXIMATELY 2 MONTHS SUBSEQUENT TO TERMINATION OF INSTRUCTION. IQ, READING ABILITY, GRADE POINT AVERAGE, SEX, AND AGE DATA WERE COLLECTED. TESTING PHASES ADMINISTERED CONSISTED OF (1) CONTENT TEST DESIGNED TO TEST FOR FACTUAL AND CONCEPTUAL KNOWLEDGE, (2) THE WATSON-GLASER CRITICAL THINKING APPRAISAL, (3) THE CORNELL CRITICAL THINKING TEST, AND (4) AN ATTITUDE SURVEY OF STUDENTS. THE MAJOR FINDINGS OF RESEARCH WERE THAT THERE WERE SIGNIFICANT DIFFERENCES BUT NO IDENTIFIABLE PATTERN IN THE PERFORMANCE OF THE CONTROL GROUP AND THE EXPERIMENTAL GROUP ON THE CONTENT EXAMINATIONS AND THE CRITICAL THINKING TESTS. (GC)

ED010007

A STUDY OF EFFECTIVENESS OF DIFFERENT METHODS OF TEACHING INTERNATIONAL RELATIONS TO HIGH SCHOOL STUDENTS, FINAL REPORT]

Final Report

Cooperative Research Project No. S-270

by

Dale M. Garvey and William H. Seiler

Kansas State Teachers College
Emporia, Kansas
February 28, 1966

The research reported herein was supported by the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education, and Welfare.

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

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ACKNOWLEDGEMENTS

The investigators are indebted to the two high schools which cooperated in this project -- Lawrence (Kansas) High School and Washburn Rural High School, Topeka, Kansas. To each of the students of these two schools who labored as members of the control group or of the experimental group, the investigators would like to be able personally to express their appreciation for the diligent application to the work of the project and for the subjection to multiple testing during the research program.

Special debt is acknowledged to the two cooperating teachers, Mr. Tom O'Dell of Washburn Rural High School and Mr. Donald A. Binns of Lawrence High School, and appreciation to the following: Mr. W. A. McElroy, Superintendent of Schools, Unified School District No. 437; Mr. Curtis Stoll, Principal, Washburn Rural High School; Mrs. Mary Colaw, Guidance Councilor, Washburn Rural High School; Dr. Carl S. Knox, Superintendent, Lawrence Public Schools; Mr. Dan Kahler, former Principal, Lawrence High School; Mr. H. C. Stuart, Vice Principal, Lawrence High School.

Others who have contributed materially to this report are far too numerous to list. To attempt to do so would inevitably result in the omission of individuals whose names should be included. Therefore, a general expression of appreciation must serve for all of them, excepting a concluding special

mention of thanks to Professor James A. Robinson, Department of Political Science, The Ohio State University, for encouragement and advice; Professor Joost Yff, Office of Research and Institute Grants, Kansas State Teachers College, for assistance in analysis of the data and for a never-ending sympathy and willingness to help; and Mrs. George Ouzounian, Mrs. Bruce Fleeker, and Mrs. Lester Wall, for their excellent abilities and their cheerful retyping of many drafts in the preparation of this typescript.

DMG and WHS

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I. Problem.

The purpose of this research project was to determine the effectiveness of simulation as an instructional technique when used in conjunction with the more traditional lecture and discussion methods of instruction in the social studies. This project employed a model of an inter-nation simulation to develop an understanding of (1) the interrelationships among nations, and (2) the complexity of foreign and domestic policy formulation and execution. The inter-nation simulation was employed because it had already been developed and was available for testing in a developmental study. It has been the continuing hope of the investigators that additional experimentation may be conducted employing other types of simulation models, such as a model of American national government.

Simulation has been utilized in recent years as a means of developing and testing theories of the social processes and/or to provide an opportunity to students to acquire knowledge of functions, relationships, or decision-making which they would not normally be able to acquire except through actual situations involving real people and real decisions. Such real world situations are, of course, not usually available to students. Several universities have therefore used

simulation, particularly simulations of international relations. Business games, war games, and crisis games are also applications of the simulation techniques.

The increasing use of simulation has coincided with the recent educational emphasis upon learner involvement and the potential value which may be derived by introducing conceptual structures into instruction with less prior knowledge and at an earlier age than formerly has been considered feasible. Simulation involves the introduction of structure, as used by Jerome Bruner, and directly involves the student in problem-solving activities.

Although not a new development, e.g. the United States Army has for many years used free two-sided map maneuvers for instructional purposes, simulation heretofore has been untested in reference to its effectiveness when compared with traditional teaching methods. The results of a test are of great importance to the entire field of education, with particular importance to the field of social studies education.

It should be stressed that the investigators view simulation only as a supplement to traditional methods of instruction. It does not supplant any acceptable method, nor is it a substitute for good teaching.

A. Definition of Terms

Simulation -- A functional model of a social process, so constructed as to present a simplified view of the operations and relationships of an actual social system.

Model -- A small-scale working replica of a social system. (A model may be a physical or symbolic representation of an object, a representation which incorporates or reproduces those features of the real object that the researcher deems significant for his research problem.)[1]

Social system -- A term used to designate a portion of a total society in the same manner that "circulatory system" designates a portion of a human body. In this research project the social system investigated was a "political system," signifying a portion of the social system which is concerned with political aspects of the society.

Attitudinal changes -- Changes of attitude which alter the conceptual frame-of-reference toward the partial or the total environment. The partial environment with which this study was concerned was a symbolic and fictitious international political system. The total environment toward which it was desired to test attitudinal changes of students was the real world political system in which the United States functions as a principal element.

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[1] Richard E. Dawson, "Simulation in the Social Sciences," Simulation in Social Science: Readings, Harold Guetzkow, editor (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1962), p. 3.

Structure -- The understanding of a subject in a manner which permits the meaningful relation to it of other things; e.g. the arrangement of problems in an equational form to permit the use of known values to assist in making unknowns knowable.

Concept -- A generalized statement which provides a relationship of meaning and significance for two or more instances or occurrences. As used in this experiment, "conceptual knowledge" refers to a generalized or universal statement which offers a means of connecting and relating particular instances or occurrences, and provides a basis for the student to make such conclusions upon encountering such instances in the future.[2]

Fact -- Instance or occurrence, or "bit" of information which is actual, but which by itself may or may not have value, meaning, or significance. "Factual knowledge" as used in this experiment refers to instances, occurrences or bits of information which are not related to other such instances and occurrences in a manner which provides meaning and significance for future use of that knowledge.[3]

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[2] Adapted from Mary Brodbeck, "Logic and Scientific Method in Research on Teaching," Handbook of Research on Teaching, N. L. Gage, editor (Chicago: Rand McNally & Company, 1963), pp. 55-56.

The presentation of information in a factual manner provides to the student the "bits and pieces" of knowledge in the same manner that a child's construction set contains the necessary elements for the construction of model buildings, machinery, etc. However, without the provision of the necessary plan or pattern which enables the elements of the construction set to be assembled in an appropriate relationship with one another, the construction set has little if any value to a child. As used in this experiment, the pattern or plan is provided by the idea represented as "conceptual knowledge."

B. Assumptions

From observation in high school classrooms, in college classes, in extensive military experience, and from study and discussion with persons involved in the use of simulation, the investigators formed the following assumptions:

1. The value of the educational process is enhanced if the structure (i.e., the conceptual frame-of-reference) is emphasized in the learning situation.

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[3] *Ibid*.

2. The provision of a structure to which facts can be related results in the acquisition of more factual knowledge and greater retention of that knowledge.
3. A meaningful operational model (such as a simulation) permits instruction concerning complex structures at a stage in conceptual maturity that is considerably earlier than is customarily believed feasible because the structures can be presented in relatively simple terms.
4. Learning is easier, more enjoyable and more meaningful if the learner acts as would a person engaged in the actual conduct of the subject of instruction, rather than engaging in unrelated activity. To perform the same type of activities as those to be performed by the adult in a fully operative environment is to do what Bruner describes as "personalizing" knowledge.[4]
5. Increased student motivation occurs in simulation, and results in increased receptivity which is

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[4] Jerome S. Bruner, "The Growth of Mind," The American Psychologist, XX (December, 1965), p. 1015.

conducive to better learning.[5]

C. Hypothesis

Based on the assumptions, the investigators proposed to test the following hypothesis:

> Simulation produces significantly greater acquisition and retention of factual and conceptual knowledge (for this project, specifically in the area of international relations) than do lecture-discussion techniques when used in the high school classroom; and the use of simulation encourages a statistically significant increase in the development of the ability of the high school student to transfer problem-solving abilities from the partial environment to the total environment.

It was expected that the measurements conducted during the experiment would indicate that (1) in comparison with a control group, the mean scores of students using the simulation technique would be significantly higher on a test designed to measure factual and conceptual knowledge acquired during the six-week unit of instruction in international affairs; (2) in comparison with a control group they would be significantly higher on a content test given approximately two months subsequent to the termination of the unit of instruction, indicating a greater retention of knowledge; (3) the experimental group would demonstrate significant changes in adopting attitudes toward international relations which would reflect an appreciation of the complexity of such relations as contrasted with a more simple "good" or "bad" appraisal of situation arising among nations; and (4) the mean score of students in the experimental group would be significantly higher on a test designed to measure critical thinking ability than that of students in the control group.

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[5] Debt is acknowledged to Jerome S. Bruner for much of the formulation employed in these assumptions, specifically to The Process of Education (New York: Vintage Books, Random House, 1963).

II. Related Research.

The paucity of research on the effectiveness of simulation as a teaching technique required the investigators to rely somewhat upon reported observations concerning it. After using simulation in a college course at the Massachusetts Institute of Technology, Bloomfield and Padelford concluded that simulation,

> . . . can produce tangible results over and above what can be taught and learned about politics by more usual methods of instruction. We are sufficiently convinced of the productive results to have decided that this technique should be tried, on varying bases, in other courses, and be made more or less a standing part of the curriculum in International Politics and American Diplomacy.[6]

Harold Guetzkow and his associates at Northwestern University report that simulation produces the following benefits:

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[6] Lincoln Bloomfield and Norman Padelford, "Three Experiments in Political Gaming," The American Political Science Review, LIII (1959), 1105-1115. Quote from page 1112.

> Simulation heightens the interest and motivation of students in several ways. . . . Simulation offers an opportunity for applying and testing knowledge. . . . Simulation produces greater understanding of the world as seen and experienced by the decision-maker. . . . Simulation provides a miniature world that is easier for the participant to comprehend as a whole than are the real institutions themselves.[7]

The RAND Corporation has used simulation primarily to develop theory, but Goldhamer and Speier state that participants gain,

> . . . new insights into the pressures, the uncertainties, and the moral and intellectual difficulties under which foreign policy decisions are made.[8]

The above stated observations are important because they publicized the initial simulation runs that were conducted in various parts of the country and indicated the characteristics of simulation activities. However, research studies on the value of simulation for teaching have been limited because only recently has there been available any development of simulated environments suitable for classroom use.

Robinson and Snyder compared simulation and case studies.

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[7] Harold Guetzkow, ed., Simulation in International Relations: Developments for Research and Teaching. (Englewood Cliffs, N. J., Prentice-Hall, Inc., 1963), pp. 152-154.

[8] H. Goldhamer and H. Speier, "Some Observations on Political Gaming," World Politics, XII (1959), pp. 71-83.

They hypothesized that simulation would generally prove superior to case studies as a supplementary teaching activity. This hypothesis was not substantiated but two important findings were determined. These were that,

> . . . behavioral measures of interest reveal simulation to be more involving and interesting than case studies and . . . simulation offers much more student-to-student feedback than case discussion sections.[9]

Coleman and Boocock[10] investigated the effects of games with simulated environments in high school classes. The first report of this project was released in October, 1963, and provided an evaluation of a man-computer election game. As with the Robinson-Snyder experiment, the game or simulated environment did not have any significant effect on the learning of factual materials. It was reported, however, that student interest remained high during the play of the game. There was a significant lack of discipline problems. Student attitudes were altered toward politicians and political roles in society. Student attitudes tended to reflect a more realistic (contrasted to idealistic) attitude toward politics following the game.

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[9] James A. Robinson and Richard C. Snyder, A Comparison of Simulation, Case Studies, and Problem Papers in Teaching Decision-Making. (Evanston, Ill.: Cooperative Research Project No. 1568, 1964, Mimeographed).

[10] Sarane S. Boocock, Effects of Election Campaign Game in Four High School Classes. (Baltimore: Department of Social Relations, the Johns Hopkins University, 1963, Mimeographed).

Cherryholmes[11] conducted a tentative and preliminary evaluation of simulation in teaching international relations to high school students. One finding indicated that the students did not gain general social studies skills, but a second finding indicated that simulation activities did tend to alter attitudes about international relations to a significant degree.

The tentative nature of these research studies indicated the need for further investigation into the pedagogical effects of simulation. None of the research except the small uncontrolled study by Cherryholmes investigated simulation of international relations in high school.

III. Procedures.

This study was designed to determine whether simulation activities contributed significantly to the learning of high school students when used as a supplementary class activity in a six-week unit on international relations. Data were gathered in the areas of acquisition and retention of factual and conceptual knowledge, retention of factual and conceptual knowledge over a period subsequent to the instructional unit, and the effect upon the ability of students to transfer problem-solving abilities to unrelated areas of activity.

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[11] Cleo H. Cherryholmes, Simulation in International Relations: Developments for High School Teaching. (Unpublished Master's thesis, Emporia, Kansas: Kansas State Teachers College, 1963).

The data were collected for experimental groups employing simulation and for control groups which had instruction similar in all respects except that simulation was not used. The research population was obtained by arbitrary selection of classroom groups.

A. Experimental Design

There were two groups of high school students involved in the study. The students were those enrolled in 12th-grade American government classes at Lawrence (Kansas) High School and those in the same course at Washburn Rural High School, Topeka, Kansas, comprising a total of 405 students. In both high schools, students with general abilities indicated by the grades "A" to "C" inclusive were grouped heterogeneously by class.

The regularly constituted classes in the courses in each of the high schools were selected arbitrarily for inclusion in either the experimental group or in the control group. The same teachers taught both groups. Five of the classes (containing 225 students, or 55.5 per cent of the population) constituted the experimental group. This group employed simulation to supplement substantive materials on international affairs. The other 180 students, or 44.5 per cent, constituted the control group, and had instruction similar in every respect to that received by the experimental group, except that simulation periods were replaced by lectures and discussions. The two groups were not combined for any part of the instruction.

In order to provide control of content and presentation, both groups employed identical materials and schedules of instruction during the experimental phase, February 1-March 12, 1965. (See Appendix A for details of the instructional schedule). Simultaneous conduct of the instruction in each cooperative school during the same six-week period lessened the possible skewing effects of extraneous influences, such as an international crisis situation. Conduct of the experiment during the second semester of 1964-65 also avoided possible emotional content resulting from the 1964 elections.

Lesson plans were developed by the investigators and the participating teachers. Materials used included the Great Decisions materials of the Foreign Policy Association.

The Great Decisions materials are issued annually by the Foreign Policy Association, and are continually reviewed and reevaluated up to the time of publication in order to assure that selected problem papers represent pressing contemporary issues. The use of this material helped to assure that the unit of instruction would maintain high student interest and materially assisted in developing student awareness of the complexity of actual problems in international affairs and in foreign and domestic policy formulation.

B. The Teachers

Teachers of the experimental and of the control groups had both had prior experience in the conduct of simulation. They were the teachers who regularly taught the research population in social studies classes in the two cooperating high schools. Both teachers had previously taught units on international relations. The same teachers in each cooperating high school taught both the experimental and the control classes. They prepared standardized units of instruction for the experimental groups and for the control groups. They were also consultants on this project to assist in the analysis of the collected data and the preparation of the report.

C. The Simulation

The simulation model used in this study was a pre-tested device developed for use in high school classes. It was developed by Cherryholmes as a basis for the preparation of an unpublished Master's Thesis, Simulation of International Relations for High School Teaching, under the direction of the investigators, and submitted to the Division of Social Sciences, Kansas State Teachers College. The simulation structure was adapted in part from the Northwestern University inter-nation simulation, and incorporated suggestions offered by Professor Harold Guetzkow of that university.

The simulation model was further refined and employed by the investigators and Cherryholmes during the Kansas State Teachers College summer session of 1964 as a portion of the program of instruction provided in the fifth annual Kansas Institute on International Affairs. The simulation model was employed both as a teaching device to facilitate learning for the graduate students enrolled in the Institute, and also as a means of introducing experienced teachers to the use of simulation.

D. The Experimental Program

The experimental program was designed to determine the significance of change between the experimental group and the control group in the areas of:

1. acquisition of factual and conceptual knowledge of international relations.
2. retention of factual and conceptual knowledge of international relations.
3. student ability to perform critical thinking.
4. student recognition of the complexities of international relations.

The experimental testing program consisted of a number of instruments administered both to the experimental group and to the control group. The testing was divided into three phases.

Phase I testing consisted of tests administered prior to the introduction of international relations material in the unit of instruction during the first portion of the second semester (February-March, 1965). Phase II testing tested changes occurring in students in both groups following the termination of the instruction (six-weeks). Phase III testing consisted of a test at the end of the school year designed to measure the retention of factual and conceptual knowledge acquired during the period of instruction, as compared with the knowledge held at the start of Phase I and the knowledge held at Phase II testing.

E. Acquisition of Data

Because of the lack of time for full development of a complete testing program, and also the lack of research assistants at the time the experiment was designed and begun, the data initially acquired on each student and the assignment of students to experimental or control classes were the normal testing and the usual assignment procedure employed at the participating schools. For these reasons, there was no attempt made to match classes, nor to match the experimental and the control groups according to any criterion.

The data collected from available school records consisted of the following:

1. I.Q. Both participating schools employed the

Henmon-Nelson Tests of Mental Ability. Washburn Rural High School used Form A, and Lawrence High School used Form B.

2. Reading Ability. Washburn Rural High School utilizes the Diagnostic Reading Tests, Form A, published by the Committee on Diagnostic Reading Tests, Inc. Lawrence High School uses the advanced test designed for high school students published as the Iowa Silent Reading Test. (As the differentiation afforded by the reading tests was not useful for the experiment and the population tended to cluster at the upper end of the scale on both tests, reading ability was discarded as a significant variable in this experiment).
3. Grade Point Average. The grades of the students for the two previous years in high school were recorded on the basis of 4.0 = A. Grades were compiled from school records and the average grade was computed for each student.
4. Information concerning the sex and age of each student was also acquired from school records. Age was computed to the nearest month as of December 31, 1964.

In addition to the data from school records, additional tests were administered during three phases of the experiment.

These phases occurred as follows:

1. Phase I. During the period of January 25-28, 1965, immediately prior to the start of the six-week unit on international relations, the following tests were administered to the students involved in the experimental project, both those of the experimental group and those of the control group:

a. Content Examination, developed by the investigators and the cooperating teachers. The test was submitted to qualified authorities in the field of international affairs, and their comments were requested concerning the structure of the test. Among the consultants commenting on the test were James A. Robinson, Department of Political Science, The Ohio State University, and Norman W. Pilgrim, Assistant Director of the Foreign Policy Association, Boulder, Colorado. (A copy of the test is attached as Appendix B).

The content examination was designed to test for factual and conceptual knowledge possessed by the student. The test was keyed to the Great Decisions materials published annually by the Foreign Policy Association, which were employed as a base for substantive information concerning international affairs. The test was administered during Phase I to determine the amount of knowledge possessed by each student prior to the receipt of any instruction in international relations.

b. Critical Thinking Appraisals. Two critical thinking appraisals were employed. One was the standardized Watson-Glaser Critical Thinking Appraisal, Form Am. The other was the Cornell Critical Thinking Test, Form X, 1961, developed by Robert H. Ennis and Jason Millman, published as an Experimental Edition. (Attached as Appendix C). These two tests were utilized in an effort to secure corroborative data to evaluate the relative efficacy of the two different methods of instruction employed in the experiment -- simulation as a supplement to lecture-discussion, and lecture-discussion alone -- and determine if students enhanced their ability to solve problems.

(1) The Watson-Glaser Appraisal contains five sections. The first is designed to sample ability to discriminate among degrees of

truth or falsity or probability of inferences drawn from given facts or data. The second test is designed to sample ability to recognize unstated assumptions in given assertions or propositions. The third test samples the ability of the student to reason deductively from given premises. The fourth test samples the ability to weigh evidence and to distinguish between unwarranted generalizations and probable inferences which, though not conclusive, are warranted beyond a reasonable doubt. The fifth test is designed to sample ability to distinguish between arguments which are strong and important to the question at issue and those which are weak and unimportant or irrelevant.[12]

(2) The Cornell Critical Thinking Test contains four sections. The first section is designed to test inductive reasoning ability. The second section is designed to test the

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[12] Manual: Watson-Glaser Critical Thinking Appraisal (New York: Harcourt, Brace & World, Inc., 1952), p. 1.

ability to discriminate concerning the reliability or unreliability of information provided. The third test is designed to test deductive reasoning ability, and the fourth test is designed to test the ability of the student to recognize assumptions and to make findings or decisions in circumstances in which those assumptions must be used.[13]

These tests were employed to determine if there is a statistically significant difference demonstrated by the experimental group in comparison with the control group after the experience of simulation. The first administration of the tests was to obtain base data and to determine if there were any differences among the various groupings. The second administration during the second phase of testing was to obtain data for measuring what change, if any, took place in critical thinking ability.

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[13] "Information Sheet" distributed by Ennis and Millman with the Experimental test.

c. Attitude Survey. The International Relations Attitude Survey was a test developed by Cherryholme and Binns at Lawrence High School for the purpose of obtaining an indication whether the attitudes of students shifted in significant directions as a result of instruction in international relations. The survey consists of 31 statements to which the student is to reply with responses indicating "Strong Agreement," "Agreement," "Undecided" (indicating no opinion), "Disagreement," and "Strong Disagreement."

No satisfactory attitude test in international relations is known to exist. This test is one that had been used previously in experimental situations at Lawrence High School in relation to the same simulation model. As a result of these considerations, the attitude survey was used without revision, although some of the statements contained could probably be stated more accurately or with less directive influence upon the students. (See Appendix D).

2. Phase II. Phase II testing occurred during the period of March 9-12, immediately following the

termination of the unit of instruction on international relations. The purpose of the testing at this point in the experiment was to determine if there were statistically significant differences in the scores made by the students in both the control group and in the experimental group when compared with their respective scores made on the same tests during Phase I. The tests used in Phase I were again administered in this phase. The same forms of the same tests were employed in each instance.

3. Phase III. Phase III testing was conducted at the end of the school year during the period May 4-7. The Content Examination was the only test administered during this phase. The purpose of the test was to measure the amount of information, both factual and conceptual, retained by the students following a period of almost two months in which they had received no instruction concerning international relations. This phase of testing was designed to measure if there were a statistically significant difference in the amount of factual and conceptual knowledge retained by the experimental group when

compared with the control group. It was hypothesized that the difference, if any, would be the result of the experimental group experiencing simulation, as all other factors remained unchanged.

IV. Analysis of the Data.

Initially the analysis of the data was confined to an attempt to determine if there were significant differences (1) between the control group and the experimental group as entire groups, (2) between the two schools (Washburn Rural High School and Lawrence High School) and (3) among the various class groupings which composed the experimental group and the control group. This approach was not entirely successful for a number of reasons.

The principle difficulty encountered with the type of analysis initially planned was that the groups were not comparable and it was impossible to rearrange the students among the classes. The students had completed their scheduling and had been assigned to classes prior to the beginning of the experiment. It was therefore impossible to rearrange the entire schedule of approximately 405 high school students. Due to the lack of research assistants, and the fact that the two cooperating teachers and the investigators were operating alone and were unable to perform some refinements in the design, it was necessary to continue the experiment with the students in the classes to which they had originally been assigned without regard to the possible desires of the investigators.

The variables of sex and age were not included in the analysis of the data initially performed as it was not believed that there was adequate reason for comparing these variables with the data collected on the other variables. The data collected on reading ability were also disregarded in the analysis as the tests administered by the respective cooperating schools did not discriminate and the students tended to cluster at the high end of the scale on reading ability.

The initial treatment of the data concerned a correlation coefficient among the nine variables as follows:

(1) grade point average
(2) intelligence quotient
(3) pre-content examination
(4) post-content examination I
(5) Cornell critical thinking pre-test
(6) Watson-Glaser Critical Thinking Appraisal, pre-test
(7) Watson-Glaser Critical Thinking Appraisal, post-test
(8) Cornell critical thinking post-test
(9) post-content examination II

In all cases, the prefix "pre" refers to the test given at the start of the experiment during the period January 25-28. The prefix "post" always refers to an examination given March 9-12, at the close of the six-weeks unit of instruction with one exception. The one exception is the post-content II examination, which was given at the end of the semester during the period May 4-7.

The grade point average for each student was compiled from school records. Grade points were determined on the basis of 4.00 equalling an "A". Table I indicates the mean grade point average and the standard deviation for various groupings of students in the population involved in the project.

TABLE I

NUMBER, MEAN AND STANDARD DEVIATION
OF
GRADE POINT AVERAGES FOR VARIOUS GROUPS

GROUP	NUMBER	MEAN (4.00="A")	STANDARD DEVIATION
All Students	272	2.56	.61
All Experimental Students	147	2.55	.63
All Control Students	125	2.58	.59
All Lawrence Students	184	2.59	.58
Lawrence Experimental Students	98	2.56	.59
Lawrence Control Students	86	2.63	.57
All Washburn Students	88	2.51	.66
Washburn Experimental Students	49	2.54	.70
Washburn Control Students	39	2.47	.62

Table II indicates the number, mean, and standard deviation for the intelligence quotient (based on the Henmon-Nelson Tests of Mental Ability) of the various groups listed in Table I. There is no indication of significant difference among the means of any of the groups.

TABLE II

NUMBER, MEAN, AND STANDARD DEVIATION OF INTELLIGENCE QUOTIENT FOR VARIOUS GROUPS

GROUP	NUMBER	MEAN	STANDARD DEVIATION
All Students	272	112.2	14.1
All Experimental Students	147	112.8	14.6
All Control Students	125	111.5	13.4
All Lawrence Students	184	111.8	14.7
Lawrence Experimental Students	98	112.1	15.5
Lawrence Control Students	86	111.4	13.7
All Washburn Students	88	113.1	12.6
Washburn Experimental Students	49	114.1	12.5
Washburn Control Students	39	111.8	12.7

The Content Examination

To determine the reliability of the content examination, the correlation coefficient was computed by use of the test-re-test method, first comparing the second and then the third administrations of the examination with the results of the first. The first examination was administered to all students prior to the beginning of the unit of instructions on international relations. The same test was administered a second time at the termination of the unit of instruction, and again a third time at the end of the semester, or approximately two months following the termination of the unit on international relations.

The test, constructed by the cooperating teachers and the investigators, was designed to test both factual and conceptual knowledge held by the students (1) prior to the receipt of any instruction, (2) immediately following the instruction in international relations to determine any gain in knowledge, and (3) approximately two months after completion of the unit of instruction to determine how much knowledge was retained following a period of no instruction in international relations.

Table III indicates the correlation coefficients of the score distributions obtained from the various administrations of the test.

TABLE III

PEARSON PRODUCT MOMENT CORRELATION COEFFICIENTS

OF

THREE ADMINISTRATIONS OF CONTENT EXAMINATION

GROUP	NUMBER OF STUDENTS	r OF FIRST AND SECOND ADMINS.	r OF FIRST AND THIRD ADMINS.	r OF SECOND AND THIRD ADMINS.
All Students	272	.82	.80	.89
All Experimental Students	147	.84	.81	.90
All Control Students	125	.80	.80	.88
All Lawrence Students	184	.82	.80	.88
Lawrence Experimental Students	98	.85	.82	.91
Lawrence Control Students	86	.79	.78	.86
All Washburn Rural Students	88	.80	.81	.91
Washburn Experimental Students	49	.80	.79	.88
Washburn Control Students	39	.82	.85	.94

The content examination indicated a considerable increase in the amount of knowledge held by both the experimental and the control students when all students are categorized as a single group. The mean for all students increased 10.6 points, comparing the mean of the first post-test examination with the mean of the pre-content examination. The difference between the mean for the second post-content examination and the mean of the pre-content examination was +8.1 points. This represents a mean loss for all students of only 2.4 points during the approximate two-month period in which no instruction was received by the students concerning international relations.

The experimental group increased a total of 9.4 points comparing the mean of the pre-content examination with the first post-content examination and there was an increase of 7.1 points when the mean of the pre-content examination is compared with the mean of the second post-content examination. This represents a decrease of only 2.3 points in the amount of knowledge held by all the experimental students at the end of the experimental period.

When the mean for all control students on the pre-content examination is compared with the mean of first post-content examination there is an 11.8 points increase. When the mean of the post-content II examination is compared with the mean of the pre-content examination, there is a difference of 9.2 points increase in amount of knowledge retained over the same amount of knowledge held by that group of students at the time of the pre-content examination. The loss of knowledge between the post-content I examination and the post-content II examination was thus 2.6 points for the control group, compared to only 2.2 points for the experimental group.

The categories of groups and the number within each group, the mean for that group and its standard deviation for the pre-content examination and for each of the two post-content examinations is indicated in Tables IV through VI.

TABLE IV

NUMBER, MEAN AND STANDARD DEVIATION FOR VARIOUS GROUPS ON THE PRE-CONTENT EXAMINATION

GROUP	NUMBER	MEAN	STANDARD DEVIATION
All Students	272	41.6	10.6
All Experimental Students	147	42.0	10.6
All Control Students	125	41.3	10.5
All Lawrence Students	184	40.8	10.6
Lawrence Experimental Students	98	41.2	10.7
Lawrence Control Students	86	40.3	10.3
All Washburn Students	88	43.4	10.4
Washburn Experimental Students	49	43.6	10.1
Washburn Control Students	39	43.3	10.7

TABLE V

NUMBER, MEAN, AND STANDARD DEVIATION FOR VARIOUS GROUPS ON THE POST-CONTENT I EXAMINATION

GROUP	NUMBER	MEAN	STANDARD DEVIATION	DIFFERENCE BETWEEN MEAN OF PRE-CONTENT EXAM AND POST-CONTENT I EXAM
All Students	272	52.2	13.8	+10.6
All Experimental Students	147	51.4	13.7	+ 9.4
All Control Students	125	53.1	13.8	+11.8
All Lawrence Students	184	50.6	13.6	+ 9.8
Lawrence Experimental Students	98	50.0	14.0	+ 8.8
Lawrence Control Students	86	51.3	13.0	+11.0
All Washburn Students	88	55.5	13.7	+12.1
Washburn Experimental Students	49	54.3	12.7	+10.7
Washburn Control Students	39	57.0	14.7	+13.7

TABLE VI

NUMBER, MEAN, AND STANDARD DEVIATION FOR VARIOUS GROUPS ON THE POST-CONTENT II EXAMINATION

GROUP	NUMBER	MEAN	STANDARD DEVIATION	DIFFERENCE BETWEEN MEANS OF: PRE-CONTENT	POST-CONTENT I
All Students	272	49.8	15.3	+ 8.1	-2.4
All Experimental Students	147	49.1	14.6	+ 7.1	-2.3
All Control Students	125	50.5	15.9	+ 9.2	-2.5
All Lawrence Students	184	47.4	15.2	+ 6.5	-3.2
Lawrence Experimental Students	98	47.0	14.8	+ 6.2	-3.0
Lawrence Control Students	86	47.7	15.7	+ 7.3	-3.6
All Washburn Students	88	54.8	14.0	+ 7.3	-0.7
Washburn Experimental Students	49	53.3	13.4	+ 9.7	-0.9
Washburn Control Students	39	56.6	14.6	+13.3	-0.4

In order to determine if there were significant differences among the groups utilized in the experiment, there was performed an additional treatment of the data obtained in the experiment. The subjects in the sample population were randomly deleted from groups in order to achieve proportional cell frequencies for the analyses of variance. By inspection it was determined that the variables which appeared to be deserving of further analysis were those of sex, intelligence quotient level, and treatment (based upon each of the three types of tests administered to the sample population.) Each high school group was examined independently on the assumption that differences, if any, would be more apparent within each school than within either the control or the experimental groupings.

The variable of sex was examined because of the differential effect which sex is know to have in some learning situations. It was also speculated that there might be some interaction between sex and the employment of simulation, the presentation mode employed with the experimental group in this experiment. The possibility of an interaction between the sex of the teachers and the sex of students was also recognized. However, as both teachers were male, it was impossible to measure this interaction.

The intelligence quotient level was also included as one of the variables. The reason for the inclusion of this variable is obvious as it would normally be anticipated that IQ level would possess some significant interactions with the treatments accorded the various groupings. For the analyses of variance, those subjects who possessed an intelligence quotient above the median for the sample were included in the High IQ Level group. Those subjects whose IQ's were below the median IQ for the sample were included in the Low IQ Level group.

The cells were constructed as indicated below.

Lawrence High School

	Male		Female	
	High IQ	Low IQ	High IQ	Low IQ
Experimental	22	22	22	22
Control	16	16	16	16

Washburn Rural High School

	Male		Female	
	High IQ	Low IQ	High IQ	Low IQ
Experimental	9	9	9	9
Control	9	9	9	9

The following null hypotheses were then tested:

A. H_{o1} There is no differential effect due to sex in the differences between the mean scores scored by the sample population on the treatments recorded as content examinations, Watson-Glaser Critical Thinking Appraisals, and Cornell Critical Thinking Tests.

B. H_{o2} There is no differential effect due to intelligence quotient level between the mean scores scored by the sample population on the treatments recorded as content examinations, Watson-Glaser Critical Thinking Appraisals, and Cornell Critical Thinking Tests.

C. H_{o3} There is no differential effect due to the treatments themselves when the mean scores of each administration of those measurements are analyzed.

Table VII indicates the results of the analysis of variance of the difference measures between the pre-content examination and the post-content I examination for Lawrence High School, and Table VIII lists the same information for the differences between the post-content I examination and the post-content II examination. Tables IX and X provide the same information, respectively, for Washburn Rural High School.

TABLE VII

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN PRE-CONTENT EXAMINATION AND POST-CONTENT I EXAMINATION

LAWRENCE HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	.94	.94	--
IQ Level (B)	1	486.73	486.73	9.238[b]
Treatment (C)	1	143.20	143.20	2.718
A x B	1	118.13	118.13	2.242
A x C	1	143.61	143.61	2.726
B x C	1	7.37	7.37	--
A x B x C	1	3.61	3.61	--
Within Cells	144	7586.35	52.68	
Total	151	8489.97		

[a] Values less than unity are not reported.

[b] Significant at the .01 level. $F_{.95}(1, 150)=3.91$ $F_{.99}(1, 150)=6.81$

TABLE VIII

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN POST-CONTENT I AND POST-CONTENT II EXAMINATIONS

LAWRENCE HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	31.32	31.32	--
IQ Level (B)	1	6.32	6.32	--
Treatment (C)	1	3.58	3.58	--
A x B	1	54.48	54.48	1.088
A x C	1	208.75	208.75	4.169[b]
B x C	1	5.25	5.25	--
A x B x C	1	14.67	14.67	--
Within Cells	144	7209.50	50.06	
Total	151	7533.88		

[a] Values less than unity are not reported.

[b] Significant at the .05 level.

TABLE IX

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN PRE-CONTENT EXAMINATION AND POST-CONTENT I EXAMINATION

WASHBURN RURAL HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	84.50	84.50	1.212
IQ Level (B)	1	29.38	29.38	--
Treatment (C)	1	168.05	168.05	2.411
A x B	1	0.05	0.05	--
A x C	1	60.50	60.50	--
B x C	1	1.38	1.38	--
A x B x C	1	0.49	0.49	--
Within Cells	64	4460.22	69.69	
Total	71	4804.61		

[a] Values less than unity are not reported.

TABLE X

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN POST-CONTENT I AND POST-CONTENT II EXAMINATIONS

WASHBURN RURAL HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	200.00	200.00	6.455[b]
IQ Level (B)	1	20.05	20.05	--
Treatment (C)	1	17.99	17.99	--
A x B	1	40.50	40.50	1.307
A x C	1	43.55	43.55	1.405
B x C	1	29.38	29.38	--
A x B x C	1	20.05	20.05	--
Within Cells	64	1982.88	30.98	
Total	71	2354.44		

[a] Values less than unity are not reported.

Significant at the .05 level. $F_{.95}(1, 60)=4.00$ $F_{.99}(1, 60)=7.08$

For the Lawrence portion of the sample population, F values larger than 3.91 were significant at the .05 level, and F values larger than 6.81 were significant at the .01 level. Analyses of gains obtained between scores on the three administrations of the content examination yielded only two F values which were statistically significant at the .05 level for the Lawrence sample.

Analysis of the gain scores between the pre-content examination and the post-content I examination revealed a significant effect due to the IQ Level for the Lawrence sample. The F value is 9.238, which is significant at the .01 level. However, there is no similar result when the same comparison is made for the differences of mean gain scores between the post-content I examination and the post-content II examination. No significant effect due to IQ Level was found in analysis of gains on content tests administered to the Washburn High School sample.

It seems reasonable that analyses of content examination scores should yield a significant effect due to IQ Level. It was expected that the same differences would appear in all analyses of content examination gain scores. As this result was not obtained, there does not appear to be any satisfactory explanation of the statistically significant F value except that the result achieved on the one analysis which did appear to be significant was the result of a sampling error. Another possible explanation for this result is that the N was too small in at least some of the groupings.

The Lawrence sample had an N of 76 each for the high IQ Level and for the low IQ Level. Washburn Rural High School had an N of only 18 for each of the same groupings. The difference in the size of N's may have caused some lack of correspondence between the two statistics for analysis of content examination mean gain scores in terms of IQ Level.

There is also open to speculation the possibility that there is a difference between the acquisition of information measured by the mean gain scores computed between the pre-content examination and the post-content I examination, and the retention of information as computed by the mean gain scores between the post-content I examination and the post-content II examination. If this speculation possesses any validity, the treatment by IQ Level interactions would not provide commensurate measurements.

On the analysis of the gain scores between the post-content I examination and the post-content II examination, there appears another significant F value, indicating an interaction between sex and treatment significant at the .05 level. With the F value significant if it is greater than

3.91, the analysis indicated that F = 4.169. Again, this treatment by sex interaction was not significant on any of the other analyses performed, although the F value was sufficiently high in several instances to indicate that there is some property of sex in its interaction with the treatments which has not been discovered in the data acquired as a result of the current experiment.

The following tabulation indicates the F value for the sex by treatment interaction for each of the cooperating schools and each test.

Lawrence High School $F_{.95}$ (1, 150) = 3.91	
Pre-content with post-content I	2.726
Post-content I with post-content II	4.169
Pre-Watson-Glaser with Post-Watson-Glaser	0.589
Pre-Cornell with post-Cornell	3.118
Washburn Rural High School $F_{.95}$ (1, 60) = 4.00	
Pre-content with post-content I	0.868
Post-content I with post-content II	1.405
Pre-Watson-Glaser with post-Watson-Glaser	2.779
Pre-Cornell with post-Cornell	3.048

The nature of the sex by treatment interaction of the post-content I examination and the post-content II examination at Lawrence High School (the only F value with statistical significance) is indicated by the distribution of mean differences in the following matrix:

	Male	Female
Experimental	-2.5	-3.6
Control	-4.6	-0.9

This indicates that the males of the experimental sample and the females of the control sample recorded a smaller loss of content knowledge than did the males of the control sample and the females of the experimental sample. Any speculation concerning the cause of the interaction appears to be unprofitable.

The analyses performed for the Washburn Rural High School sample population provided only one F value of statistical significance. This value was 6.455, significant at the .05 level with a value of 4.00 or greater. In the analysis of the mean gain scores between the post-content I examination and the post-content II examination, males recorded a mean gain of -2.44, while females gained +0.89 points. It is doubtful if this statistic is actually significant in view of the relatively minor changes indicated for a test with a total of 102 points, and also the fact that the test itself is of somewhat questionable accuracy in its ability to discriminate.

In view of the hypothesized difference which simulation would enable the experimental group to demonstrate in comparison with the control group in reference to the acquisition of factual and conceptual knowledge, the scores of the pre-content and of the post-content II examination were subjected to additional analysis. This analysis was designed to discover if there were a significant difference in the mean scores of the two groups when the factual items and the conceptual items on each administration of the examination were scored separately.

The questions on the content examination were arbitrarily determined to be either "factual" or "conceptual" by the investigator and a consultant. Working independently, each individual considered each question on the content examination to determine whether it required an understanding of conceptual or factual knowledge. The grade distributions which produced the means given below were derived from scoring the pre-content and the post-content II examinations to determine the scores on each type of question for the students of the experimental group and for those of the control group.

This analysis produced an interesting comparison of the performances, in terms of their respective mean scores, of the control group and the experimental group on those items of the content examination which were labelled "factual" or "conceptual" questions. The comparison indicates that the experimental group recorded a higher mean score on the pre-content examination on both the factual and the conceptual questions than did the control group, although not significantly so. This information is similar to findings which compared the mean scores of the groups on the total examination -- the factual and conceptual items combined.

On the post-content II examination, the control group recorded a higher mean score for the entire examination than did the experimental group (53.1 to 51.4). But the mean score of the experimental group for the conceptual questions was 0.4 higher than the mean score for the control group (23.8 to 23.4), while the comparison of mean scores for the factual questions for both groups on that test favors the control group by 0.9 (24.4 to 23.5).

There is no clear meaning of the differences noted in the above comparisons. It appears reasonable, however, to infer that the comparatively better performance on the conceptual questions by the experimental group tends to support the original idea that simulation would induce significantly greater acquisition of conceptual knowledge by that group. However, the original hypothesis also stated that the same superiority would be noted for the experimental group when the acquisition of factual knowledge was compared. The obtained results tend to deny that portion of the hypothesis.

The data are reproduced below:

Experimental Group

	MEAN	STANDARD DEVIATION
Conceptual -- pre-content	18.9	7.10
Conceptual -- post-content II	23.8	8.01
Factual -- pre-content	18.9	5.19
Factual -- post-content II	23.5	7.49

Control Group

	MEAN	STANDARD DEVIATION
Conceptual -- pre-content	17.7	7.13
Conceptual -- post-content II	23.4	8.33
Factual -- pre-content	18.0	4.99
Factual -- post-content II	24.4	8.40

The difference in mean gains for each group for each type of question indicates that relatively the control group continued to perform better than did the experimental group. The differences in mean gains are as follows:

DIFFERENCES IN MEAN GAINS BETWEEN PRE-CONTENT
AND POST-CONTENT II EXAMINATIONS

	Conceptual	Factual
Experimental	+4.9	+4.6
Control	+5.7	+6.4

The Critical Thinking Tests

The Watson-Glaser Critical Thinking Appraisal was administered to all students in both the experimental and the control groups. The purpose of this test was to indicate whether as a result of the difference of treatments there was any enhancement of the critical thinking ability of the students in either group. The results of the Watson-Glaser pre-test compared with the test administered at the end of the unit of instruction indicate an overall increase in the mean score of almost four points for all students within the sample. The mean pre-test score of the Washburn High School students was 2.8 points higher than the mean pre-test score of students at Lawrence High School who were involved in the experiment. The mean score for each high school increased in the post-test on the Watson-Glaser Critical Thinking Appraisal, but again the advantage remained with the Washburn Rural High School students. The greatest mean gain was made by the control students at Washburn Rural High School who gained a total of 6.1 points between the two tests. This datum is probably not significant, however, as the number of students in the Washburn control group was only 39. Therefore, the N is probably too small to provide a significant indication of value.

Table XI provides information concerning the number, mean, and standard deviation for the various groups on the Watson-Glaser Critical Thinking Appraisal pre-test. Table XII provides the same information for the post-test for the same instrument, and the differences between the means on each administration of the test to the various groups.

TABLE XI

NUMBER, MEAN AND STANDARD DEVIATION FOR VARIOUS GROUPS ON THE WATSON-GLASER CRITICAL THINKING PRE-TEST

GROUP	NUMBER	MEAN	STANDARD DEVIATION
All Students	272	74.7	20.1
All Experimental Students	147	75.7	20.8
All Control Students	125	73.5	19.3
All Lawrence Students	184	73.8	21.5
Lawrence Experimental Students	98	74.3	22.5
Lawrence Control Students	86	73.2	20.3
All Washburn Students	88	76.6	16.8
Washburn Experimental Students	49	78.6	16.4
Washburn Control Students	39	74.1	16.9

Note: Data provided by the Manual for the Watson-Glaser Critical Thinking Appraisal indicates the following means:

For 1718 boys -- 74.89
For 1395 girls - 77.88
For 3113 total - 76.23

TABLE XII

NUMBER, MEAN AND STANDARD DEVIATION FOR VARIOUS GROUPS ON THE WATSON-GLASER CRITICAL THINKING POST-TEST

GROUP	NUMBER	MEAN	STANDARD DEVIATION	DIFFERENCE BETWEEN MEANS OF PRE-TEST AND POST-TEST
All Students	272	78.5	18.0	+3.8
All Experimental Students	147	78.7	18.0	+3.0
All Control Students	125	78.4	18.0	+4.9
All Lawrence Students	184	77.3	19.4	+3.5
Lawrence Experimental Students	98	77.1	19.7	+2.8
Lawrence Control Students	86	77.5	19.1	+4.3
All Washburn Students	88	81.1	14.3	+4.5
Washburn Experimental Students	49	81.8	13.4	+3.2
Washburn Control Students	39	80.2	15.2	+6.1

The Cornell Critical Thinking Test was also administered both prior to the instruction in international relations and immediately following the termination of that six-week unit of instruction. Once again, the largest gains were made by the students of the control classes. The only group which did not show an increase in the ability to perform critical thinking was the Lawrence experimental group composed of 98 students. This group had a loss of 0.2 points which probably is of no significance. Tables XIII and XIV provide the number, mean, and standard deviations for the various groups for the pre-test and the post-test, respectively, for the Cornell Critical Thinking test.

TABLE XIII

NUMBER, MEAN AND STANDARD DEVIATION FOR VARIOUS GROUPS ON THE CORNELL CRITICAL THINKING PRE-TEST

GROUP	NUMBER	MEAN	STANDARD DEVIATION
All Students	272	36.1	12.2
All Experimental Students	147	37.1	11.9
All Control Students	125	35.2	12.4
All Lawrence Students	184	37.0	12.3
Lawrence Experimental Students	98	37.7	11.7
Lawrence Control Students	86	36.1	12.9
All Washburn Students	88	34.3	11.8
Washburn Experimental Students	49	35.7	12.1
Washburn Control Students	39	32.5	11.0

TABLE XIV

NUMBER, MEAN AND STANDARD DEVIATION FOR VARIOUS GROUPS ON THE CORNELL CRITICAL THINKING POST-TEST

GROUP	NUMBER	MEAN	STANDARD DEVIATION	DIFFERENCE BETWEEN MEANS OF PRE-TEST AND POST-TEST
All Students	272	38.4	12.0	+2.3
All Experimental Students	147	38.3	12.5	+1.2
All Control Students	125	38.5	11.3	+3.3
All Lawrence Students	184	38.3	12.2	+1.3
Lawrence Experimental Students	98	37.5	12.8	-0.2
Lawrence Control Students	86	39.2	11.3	+3.1
All Washburn Students	88	38.7	11.7	+4.4
Washburn Experimental Students	49	40.0	11.7	+4.3
Washburn Control Students	39	37.0	11.3	+4.5

Again, it will be noted that the control groups performed better on both of the critical thinking tests than did the students in the experimental group. On only one instance in the re-test on either the Watson-Glaser or the Cornell was there a decline in the mean score of the population tested. This occurred on the re-test of the Cornell Critical Thinking Test in the instance of the Lawrence experimental students. In this test, the mean declined 0.2. On the basis of available data it is questionable if the test is sufficiently precise to measure accurately a change of only 0.2. Therefore, the decline is not interpreted as constituting a change.

As in the analysis of the content examinations, further analysis was performed in order to determine whether significant differences existed among the various groups in the experiment. Using the same random deletion to obtain proportional cell frequencies utilized for the analysis of the content examination, an analysis of variance was performed on the data acquired in the four administrations of the two critical thinking tests. The same factors of sex, intelligence quotient level, and treatment were employed.

Only two significant F values appeared in the analysis of the data for the critical thinking tests, both of which concerned the Cornell Critical Thinking Test and the Lawrence sample. An F value larger than 3.91 being significant at the .05 level, there was a significant difference in the mean gain scores recorded for the Lawrence Control group in comparison with the Lawrence Experimental group. With an F value of 4.563, the difference in performance of the two groups at Lawrence High School is illustrated by the difference in means between the pre-test and the post-test for the control group being +3.0 points, and that for the experimental group being -0.2 points. (See Table XIV) The control group scored higher on the Cornell post-test than did the experimental group. Although the net loss indicated for the experimental group is probably not significant and can be explained by the inadequacy of the test to measure accurately, the 3.0 gain by the control group indicates that some effect was registered by the control group and that the same effect was not recorded for the experimental group. As a similar phenomenon was not registered for the Washburn Rural High School sample for either the control group or the experimental group, it is speculated that the difference recorded here was simply one of sampling error.

The other F value on the Cornell Critical Thinking Test which indicated significance was the interaction of sex and IQ Level. The sex by IQ Level interaction produced an F value of 5.751 (significance at the .05 level is at the value of 3.91

or greater.) The following matrix depicts the sex by IQ interaction for the mean gains measured by comparing the first and second Cornell tests:

	Male	Female
High IQ Level	-10.9	+27.6
Low IQ Level	+31.8	- 5.6

Although it did not produce a significant F value, it is interesting to note that the largest F value achieved on the Watson-Glaser Critical Thinking Appraisal for the Lawrence sample was also the sex by IQ Level interaction. The value of that statistic was 2.616. (Significant at the .05 level at the value of 3.91 or greater.)

The reason for the interaction depicted in the above matrix is impossible to ascertain with the data available. It seems reasonable to speculate, however, that the male-high IQ Level portion of the sample population customarily performed at or near their potential capacity, and that they were the type of students who tended to be involved in the learning situations presented to them. The male-low IQ Level portion may have been low-achievers or may simply have been uninterested in the learning situations which they had previously encountered and the simulation experience enabled them to become involved to a greater degree than they had theretofore done. This speculation encounters some shoal waters, however, when it is remembered that the groups in the four cells of the matrix include equal representation from the control group and from the experimental group.

To extend the speculation, there is the possibility that the female-high IQ Level group possessed verbal or other skills which were employed to advantage in the simulation experience, while the female-low IQ Level portion did not become involved in the learning situation due to lack of motivation or skills. Again, this speculation is faulty due to the fact that the groupings included students who were included in experimental and control groups. Regardless of the correct explanation of the interaction, it is obvious that sex does play some significant role in the processes which were involved in the measurements conducted as a part of this experiment.

The results of the analysis of variance are reproduced in Tables XV through XVIII. Table XV contains the information for the Lawrence High School sample on the Watson-Glaser Critical Thinking Appraisal, and Table XVI provides the information for the same school recorded for the Cornell Critical Thinking Test. Table XVII lists the information concerning Washburn

Rural High School for the Watson-Glaser Critical Thinking Appraisal and Table XVIII provides the information for the same school for the Cornell Critical Thinking Test.

TABLE XV

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN PRE-TEST AND POST-TEST OF THE WATSON-GLASER CRITICAL THINKING APPRAISAL

LAWRENCE HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	38.00	38.00	--
IQ Level (B)	1	796.73	796.73	3.094
Treatment (C)	1	208.25	208.25	--
A x B	1	673.68	673.68	2.616
A x C	1	151.81	151.81	--
B x C	1	3.58	3.58	--
A x B x C	1	325.00	325.00	1.262
Within Cells	144	37070.40	257.43	
Total	151	39267.47		

[a] Values less than unity are not reported.

TABLE XVI

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN PRE-TEST AND POST-TEST OF THE CORNELL CRITICAL THINKING TEST

LAWRENCE HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	13.32	13.32	--
IQ Level (B)	1	652.79	652.79	--
Treatment (C)	1	31204.01	31204.01	4.563[b]
A x B	1	39329.11	39329.11	5.751[b]
A x C	1	21327.16	21327.16	3.118
B x C	1	60.55	60.55	--
A x B x C	1	130.26	130.26	--
Within Cells	144	984699.80	6838.19	
Total	151	1077417.00		

[a] Values less than unity are not reported.

[b] Significant at the .05 level.

TABLE XVII

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN PRE-TEST AND POST-TEST OF THE WATSON-GLASER CRITICAL THINKING APPRAISAL

WASHBURN RURAL HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	14.22	14.22	--
IQ Level (B)	1	1.38	1.38	--
Treatment (C)	1	93.38	93.38	--
A x B	1	4.50	4.50	--
A x C	1	382.72	382.72	2.779
B x C	1	288.00	288.00	2.091
A x B x C	1	97.99	97.99	--
Within Cells	64	8813.77	137.71	
Total	71	9696.00		

[a] Values less than unity are not reported.

TABLE XVIII

ANALYSIS OF VARIANCE OF DIFFERENCE MEASURES BETWEEN PRE-TEST AND POST-TEST OF THE CORNELL CRITICAL THINKING TEST

WASHBURN RURAL HIGH SCHOOL

SOURCE OF VARIATION	df	Sum of Squares	Mean Squares	F[a]
Sex (A)	1	703.13	703.13	--
IQ Level (B)	1	2278.13	2278.13	--
Treatment (C)	1	3403.13	3403.13	--
A x B	1	11628.12	11628.12	1.646
A x C	1	21528.12	21528.12	3.048
B x C	1	11628.12	11628.12	1.646
A x B x C	1	12403.13	12403.13	1.756
Within Cells	64	451900.00	7060.93	
Total	71	515471.88		

[a] Values less than unity are not reported.

The Attitude Survey

The attitude survey attached as Appendix D was administered both prior to the unit of instruction on international relations and immediately at the conclusion of that unit. The purpose of this test was to determine if there was a movement in student attitudes toward either a realistic appraisal of foreign affairs or toward an idealistic appraisal. In an effort to assess the direction of movement, each question on the attitude survey was determined by the investigators to represent a realistic or an idealistic attitude when the student expressed agreement or disagreement with the statement made in the survey.

The student could mark his response to the attitude survey by indicating strong agreement, agreement, undecided (i.e., no opinion), disagreement or strong disagreement. For some of the statements strong disagreement or disagreement would indicate what the investigators had arbitrarily labeled a realistic attitude. On other questions agreement in either degree would indicate a realistic attitude. On the following analysis of each statement contained on the survey there is indicated the direction in which the individual student should have responded to indicate what the investigators considered to be a realistic attitude.

The analysis of the data acquired by the administration of the attitude survey contains a greater number of respondents than is included in the analysis of the data acquired by the other tests. Although the N for the content tests and the critical thinking appraisals consisted of 272 individuals, the N on the attitude survey consists of 351 individuals. The reason for this discrepancy is that all measurements other than the attitude survey were computed only if each item of information was acquired for each individual. This caused rejection of a number of individuals contained in the initial sample simply because there was missing one item or score. It was impossible to acquire all of that information as the project described in this report was begun only after the students in the cooperating high schools had been graduated.

Because of the greater time required to prepare the data acquired by the other instruments and measurements in order to place that data in the electronic data-processing system, the analysis of the attitude survey was undertaken prior to the determination that complete data was not acquired on all students in the sample. Therefore, due to a lack of time to reprocess the data on the attitude survey, the attitude survey results are presented using the initial "N" of 351. There is no basis for assuming that there would be any significant difference displayed in attitudes if the number of subjects were reduced to 272.

There were few significant changes in the attitudes of the students experiencing simulation when compared with those of the control group. Two different tests were conducted on the results of the attitude survey which was administered both prior to and immediately after the conclusion of the unit of instruction on international relations. Each statement was tested by the application of the chi square test and by a sign test.

These tests were conducted to examine the following null hypotheses:

H_{o4} No relationship exists between attitude (as expressed through the Attitude Survey) and group over and above that attributable to sampling variability.

H_{o5} No relationship exists between attitude (as expressed through the Attitude Survey) and school over and above that attributable to sampling variability.

Both of these hypotheses were tested at the .05 significance level with two degrees of freedom. The x^2 value of 5.991 is the level at which a hypothesis is rejected. Using this level there were only four statements on the attitude survey for which the chi square test would have indicated rejection of the hypothesis on comparison of the two high schools and only three statements upon which the hypothesis could be rejected upon a comparison of the experimental and the control groups. The results of the sign test are discussed below.

Although in response to most of the statements there is a slippage in the direction of reality in the attitudes demonstrated by the students, the shift is usually insignificant in a statistical sense. Nevertheless, the slippage can be recognized by the increase in the number of respondents either moving to agree (or disagree) in the direction of reality, or moving to an "undecided" selection, indicative of less certainty that the previous position was an adequate position. It is interesting to note that of the 31 statements, 23 elicited responses which indicated student attitude changes in the direction of reality, five represented essentially no change or a movement to "undecided," and only three statements were marked by increases in the direction of unreality.

One of the statements which received increased response in the direction of unreality was Statement 7 in which the responses indicated the students continued to agree with their initial position, but their agreement was merely less enthusiastic. This statement dealt with alliances and United States policy, and it is speculated that the slippage from "Strong Agreement" to "Agreement" merely indicated a disenchantment with alliances, possibly because of the concomitant problems they generate.

Each statement is repeated in the following pages with data to indicate the responses and their significance. Immediately following each statement is the chi square score and the z-score of the sign test. Below the statistical information is listed the number of students making each possible response to the statement, and the direction (agreement or disagreement) which the investigators considered represented a realistic attitude.

Statements 1, 3, 23, and 29 generated statistically significant chi squared differences in responses by the two schools. Statements 1 and 23 were the result of little or no shift in attitude by the Washburn Rural High School students. Statements 3 and 29 indicate little or no shift by Lawrence High School students. Statements 1, 14, and 31 represent significant differences between the control and the experimental groups. Statements 1 and 14 are the product of little or no shift by the Experimental group, and Statement 31 was produced by a shift in the Control group toward the direction of unreality.

Further analysis of the data obtained on the attitude survey was undertaken in an attempt to learn if there was significance in the change in the direction of movement of a student's choice as registered upon the attitude survey administered at the beginning of the experiment compared with that administered again at the termination of the unit of instruction. The movement was indicated only by direction (i.e., toward agreement or disagreement), and the magnitude of that movement was disregarded. A sign test was then performed and the results were translated to z-scores to simplify their interpretation.

The sign test was a one-tailed test, and significance at the .05 level is at a value of 1.64. Upon this criterion, a considerable number of significant scores was obtained. The following tabulation indicates the numbers of significant z-scores for the various groupings:

TABLE XVIX

NUMBER OF SIGNIFICANT Z-SCORE VALUES BY VARIOUS GROUPS IN RESPONSE TO STATEMENTS ON THE ATTITUDE SURVEY

TOTAL SAMPLE	LAWRENCE	WASHBURN	EXPERIMENTAL	CONTROL
12	13	4	10	12

These results indicate that H_{o4} (no difference between groups) should be rejected 17 times, H_{o5} (no difference between schools should be rejected 15 times, that 14 times the hypotheses should be rejected concurrently both for the schools and the groups, and that for the total sample, both hypotheses (stated on page 67) would be rejected 12 times.

Of greater interest are the items of the attitude survey for which a z-score of significance was developed in three or more of the groupings listed above. For convenience, the items for which rejection of the hypotheses is indicated have been extracted from the complete data provided on pp. 78-93 of this report concerning each statement. The following tabulation lists the statement number for which rejection of the hypothesis is indicated, and the groups for which a significant z-score was recorded for that statement. If a blank exists under a heading, that is indication that the z-score was not significant at the .05 level.

TABLE XX

SIGNIFICANT Z-SCORE VALUES AND CHI SQUARE INDICATIONS BY STATEMENT AND GROUP RECORDED FOR THE ATTITUDE SURVEY

STATEMENT	TOTAL GROUP	LAWRENCE	WASHBURN	EXPERIMENTAL	CONTROL
1	5.259	5.882	x^2	2.662	x^2 5.000
2	2.710	2.361		3.066	
3			x^2 1.809	1.974	
5	2.045	2.018			2.283
8		1.944		1.667	
12	2.571	2.250		2.212	
14					x^2
15	3.226	3.182			3.375
16	3.116	3.898		2.600	1.809
17	1.956	1.865			2.556
20	3.955	3.966		3.333	2.234
21	3.828	3.214	2.031	2.128	3.295
22	2.639	1.806			2.400
23			x^2		
25					2.111
27	2.055	1.719			2.255
28	2.778	2.377		1.981	1.939
29			2.576		
30				1.765	
31					x^2 2.157

NOTE: x^2 indicates significant chi square value was also obtained.

Table XX indicates that either or both of the null hypotheses should be rejected for 18 of the 31 statements made on the attitude survey. The null hypotheses (stated on page 67) hypothesize that no relationship exists between the attitudes expressed and the fact that members of the sample were (1) part of either the experimental or of the control group, or (2) members of either Lawrence High School or of Washburn Rural High School.

Statement 21 ("The United States should always follow democratic principles in determining and carrying out its foreign policy.") produced significant z-score values for each group listed. It is probable either that this is an ambiguous statement which confused the respondents, or that the statistical significance of these data is simply that both schools and both the experimental and the control group at the end of the unit of instruction recognized the practical difficulties that confront the policy maker when he always attempts to include consideration of democratic principles in the formulation of foreign policy.

Five of the Statements (Numbers 1, 16, 20, 22, and 28) each produced four significant z-scores for the various groups. In four of these instances the significant values were for the total group, for Lawrence High School, for the experimental group and for the control group. The fifth (Number 22) had significant values for the total group, for the control group, and for both Lawrence High School and Washburn Rural High School. For the four statements, it is probably safe to assume that there was an actual significant difference between the two schools, but it is impossible to describe accurately the difference which may exist between the experimental group and the control group. The type of difference cannot be determined with the data available.

All that can be done is to infer some generalizations from the answers made to the statements. The generalizations are the product of a comparison of the answer made by each student on the pre-test of the attitude survey and the answer made on the post-test. A comparison with the position of the student on the pre-test with his post-test position provides information concerning the direction of movement of attitude, if any movement occurred. The movement is depicted on a matrix for each class for each statement. The matrix is reproduced below:

MATRIX FOR COMPARISON OF RESPONSES ON THE

ATTITUDE SURVEY PRE-TEST AND POST-TEST

		AFTER				
		SA	A	U	D	SD
	STRONG AGREEMENT					
	AGREEMENT					
BEFORE	UNDECIDED					
	DISAGREEMENT					
	STRONG DISAGREEMENT					

Using information obtained from such distributions, it is possible to describe the movement which occurred on the statements for which significant z-score values were recorded. For statement 1 (". . . decision-making on foreign affairs is a complex process".), the shift was to agreement, with the greatest shift recorded in the ocntrol group and for Lawrence High School. A shift was recorded also for the experimental group, but there was considerably less strength to the movement.

Statement 16 (referring to the time-lag between the investment in and the actual availability of new weapons) produced a strong shift toward agreement in Lawrence fifth-hour class which was part of the control sample. There was essentially no shift in the other two Lawrence control classes, although the classes which composed the experimental sample at Lawrence also shifted heavily toward agreement.

For statement 20 (". . . in making foreign policy decisions . . . all factors can never be fully understood . . .") the shift recorded was distributed generally among all class groupings and between both high schools and both experimental and control groups. No pattern or movement can be discerned.

Responses to Statement 22 (". . . the President should not be required to consult with . . . Congress before he makes important decisions.") indicated that the students were greatly confused in their responses to this statement. The responses indicated no pattern of consistency between the pre-test and the post-test position, but there was a strong tendancy for the Lawrence sample to move toward "Undecided". This may, in fact, represent a realistic appraisal of a theoretical situation.

The movement in response to Statement 28 was concentrated around "Undecided" and "Agreement." The statement (concerning provision of military assistance to dictators) produced no discernible pattern of consistency between pre-test and post-test positions, indicating that the statement caused considerable confusion in the minds of the students.

Six other statements produced significant z-score values for three of the groupings. These statements (Numbers 2, 5, 12, 15, 17, and 27) demonstrated significance at the .05 level for the total gorup, for Lawrence High School in each instance, and for the experimental group in two instances and the control group in four. These statistics probably tend to confirm that there is an actual difference between the two schools (based on those statements with four significant z-scores reinforced by the statements with three significant scores.)

Considerably greater confidence is felt in the discriminatory ability of the statements of the attitude survey when significant z-scores are produced only for one school or only for one of the groups (experimental or control.) When a significant z-score is obtained for both groupings in a category (e.g., both schools, or both the experimental and the control groups), there is reason to doubt the ability of the statement to discriminate.

Statement 2 ("The United States has no foreign policy.") produced a significant swing to disagreement, with the impetus furnished by the experimental group. The control group remained essentially unchanged in its expressed attitudes as demonstrated on the attitude survey.

Statement 5 ("A democratic nation should always employ democratic principles . . . .") developed significant values for the total group and for Lawrence High School, as did Statement Number 2. However, this statement evoked a significant value in the control group rather than the experimental group. An inspection of the recorded attitudes for each student indicates no essential pattern in the distribution. It merely appears that the control class groupings were slightly less consistent in their pre-test and post-test positions than were the experimental class groupings.

There is no pattern apparent in the movements of attitudes recorded for Statement 12 ("Democratic principles always provide sufficient guidelines for making foreign policy decisions.") Again, the significant values are for the total group, for Lawrence High School, and for the experimental group. From inspection of the scatter for pre-test and post-test recorded positions, it is not readily apparent that there is any significant difference between the experimental and the control groups. From the information available, it is unprofitable to speculate concerning the reason for the recorded differences.

Statement 15 ("The economic condition and growth . . . are very important in determining . . . foreign policy.") again produced a significant value for the control group rather than the experimental group, with Lawrence High School and the total group repeating the significant values. Here the movement was essentially from a lower to a higher degree of agreement with the statement.

Statement 17 (concerning participation of the public in important foreign policy decisions) again produced the significant value for the total group and for Lawrence High School, as well as for the control group. The responses to this statement did not form a consistent pattern; the plot of the responses appeared as a random scattering.

Statement 27 (stating that the protection of domestic industries is more important than helping other countries develop again follows the pattern of the two previous statements. Alone of the control group classes, the Lawrence third-hour class shared the trend toward disagreement for this statement demonstrated by the experimental group. Although the remainder of the classes in the control group also tended to disagree with the statement, the trend in those classes was much weaker.

Reproduced on the following pages is each statement contained on the attitude survey, followed immediately by the data obtained from the experiment. The first statistic after each statement is the chi square value for the Washburn-Lawrence comparison and for the Experimental-Control comparison. On the line below that data are the z-scores obtained from the sign test conducted for each statement. Each significant statistic is underlined.

Statement 1. "Generally speaking, governmental decision-making on foreign affairs is an extremely complex process."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2		9.034		14.507	
z-score	0.186	5.882	5.259	2.662	5.000

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	170	158	12	9	2
Post-Test	228	111	5	6	1

←--- Direction of Reality

Statement 2. "The United States has no foreign policy."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2		5.822		4.194	
z-score	1.345	2.361	2.710	3.066	0.815

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	2	4	8	111	226
Post-Test	5	5	5	80	256

Direction of Reality ---→

Statement 3. "The United States has little need to concern itself with the political stability of the underdeveloped nations."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	7.909			2.780	
z-score	1.809	-1.852	1.509	1.974	0.135

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	4	14	11	112	209
Post-Test	6	9	10	108	217

Direction of Reality ----→

Statement 4. "The eventual success of a world government is closely related to the further development of international law."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	3.809			2.119	
z-score	1.618	0.545	1.308	0.408	1.548

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	75	191	57	18	7
Post-Test	78	207	42	13	8

←---- Direction of Reality

Statement 5. "A democratic nation should always follow democratic principles in determining and carrying out its foreign policy."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	0.389			2.803	
z-score	0.526	2.018	2.045	0.638	2.283

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	86	172	37	44	9
Post-Test	75	159	44	62	8

Direction of Reality ----→

Statement 6. "Accurate information is a necessity for good foreign policy decisions."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	2.308			0.214	
z-score	0.577	-0.300	0.00	0.122	-0.128

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	237	104	2	5	3
Post-Test	237	101	3	6	4

←----Direction of Reality

Statement 7. "Alliances with other nations are only a hindrance to the United States and should be abandoned."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	0.670			0.737	
z-score	0.00	-1.038	-0.887	-0.543	-0.714

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	9	10	27	133	171
Post-Test	4	10	25	152	159

Direction of Reality ---->

Statement 8. "Non-communist nations other than the United States have the right to independent and even neutral cold war foreign policies."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	4.311			0.573	
z-score	0.00	1.944	1.615	1.667	0.568

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	58	193	59	27	14
Post-Test	72	192	55	26	6

<---- Direction of Reality

Statement 9. "International events are not important enough and will not affect the average citizen enough for him to be concerned."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	0.035			1.771	
z-score	0.667	0.784	1.017	0.00	1.538

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	12	9	5	127	198
Post-Test	6	9	5	126	205

Direction of Reality ----→

Statement 10. "Whichever country or alliance that has the balance of power is able to dictate the actions of the rest of the world."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	1.246			5.740	
z-score	-0.811	-2.903	-2.877	-0.769	-3.333

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	13	78	55	138	66
Post-Test	23	95	46	147	39

Direction of Reality ----→

Statement 11. "The United States should always try to do the "right" thing in international relations even though this course of action may not always be popular with our allies."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	3.534			2.559	
z-score	-1.912	-0.278	-1.270	-1.556	-0.222

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	77	167	52	49	5
Post-Test	68	167	62	46	7

←---- Direction of Reality

Statement 12. "Democratic principles always provide sufficient guidelines for making foreign policy decisions."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	0.626			1.423	
z-score	1.216	2.250	2.571	2.212	1.383

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	19	112	84	118	17
Post-Test	16	105	64	144	21

Direction of Reality ----→

Statement 13. "In making United States foreign policy it does not make any significant difference whether the public is informed or not."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	4.272			0.397	
z-score	-1.935	0.536	-0.469	-0.306	-0.366

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	6	14	13	112	205
Post-Test	8	18	15	114	195

Direction of Reality ----→

Statement 14. "Congress should enter into the foreign policy-making process and share with the President the power to make foreign policy decisions as much as is Constitutionally possible."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	2.508			8.032	
z-score	-1.579	-1.917	-2.465	-2.347	-1.176

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	76	151	49	56	17
Post-Test	63	148	66	55	17

←---- Direction of Reality

Statement 15. "The economic condition and growth of any country is very important in determining its general foreign policy."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	1.839			4.944	
z-score	0.862	3.182	3.226	1.354	3.375

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	129	191	24	5	2
Post-Test	154	184	10	2	1

←---- Direction of Reality

Statement 16. "The 'time lag' between investment in military research and the use of the weapons developed is sometimes important in the success of a country's foreign policy."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	5.890			0.633	
z-score	-0.429	3.898	3.116	2.600	1.809

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	31	158	123	36	1
Post-Test	47	172	102	28	0

←---- Direction of Reality

Statement 17. "The public should be informed and be allowed to participate in every major step in making foreign policy decisions."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	0.153			4.622	
z-score	0.714	1.865	1.956	0.385	2.556

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	31	73	56	150	39
Post-Test	20	65	65	157	42

Direction of Reality ----→

Statement 18. "The United States should not concern itself with power interests and imperialism but with principles of ethics in making foreign policy."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	0.190			3.033	
z-score	0.139	0.238	0.282	1.058	-0.700

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	24	90	61	142	34
Post-Test	33	97	52	141	28

←---- Direction of Reality

Statement 19. "Newspapers should be responsible and honest in reporting foreign policy decisions."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	2.012			5.181	
z-score	1.618	0.273	1.077	0.500	1.098

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	110	169	27	40	5
Post-Test	123	162	25	36	5

←---- Direction of Reality

Statement 20. "So many factors must be taken into account in making major foreign policy decisions that all of the factors can never be fully understood and evaluated."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	1.516			1.178	
z-score	1.029	3.966	3.955	3.333	2.234

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	37	162	47	90	14
Post-Test	64	168	38	67	13

←---- Direction of Reality

Statement 21. "The United States should always follow democratic principles in determining and carrying out its foreign policy."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	0.080			1.061	
z-score	2.031	3.214	3.828	2.128	3.295

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	81	178	29	54	8
Post-Test	67	153	48	69	13

Direction of Reality ----›

Statement 22. "Since delay can possibly jeopardize our national security, the President should not be required to consult with members of Congress before he makes important decisions."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	0.578			2.510	
z-score	1.806	1.984	2.639	1.373	2.400

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	24	69	50	114	93
Post-Test	22	76	74	112	66

‹---- Direction of Reality

Statement 23. "There is little reason for the average citizen to be informed about world affairs since ultimate decisions are made by a few men in Washington."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2		6.312		4.721	
z-score	-2.200	0.000	-0.982	0.595	-2.162

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	4	15	5	93	233
Post-Test	4	12	11	101	222

Direction of Reality ----→

Statement 24. "If a Congressman disagrees with his constituents about a particular issue, he should vote according to the dictates of his own conscience."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2		1.397		5.249	
z-score	1.029	-0.593	0.000	0.521	-0.510

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	84	157	51	42	15
Post-Test	88	145	43	58	15

←---- Direction of Reality

Statement 25. "The government is not justified in withholding information from the public."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	0.880			4.122	
z-score	0.278	1.102	1.087	-0.385	2.111

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	43	97	43	125	43
Post-Test	38	77	54	141	41

Direction of Reality ----→

Statement 26. "Since our foreign aid program is largely military in nature, we should not delude outselves into thinking that we give aid for any reason other than to protect our national security."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	3.896			3.182	
z-score	-1.765	1.017	0.000	-0.102	0.104

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	19	96	63	151	21
Post-Test	15	120	43	137	35

←---- Direction of Reality

Statement 27. "It is more important to protect our domestic industries than it is to help foreign countries develop industries."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	0.071			1.988	
z-score	1.081	1.719	2.055	0.660	2.255

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	33	118	98	81	19
Post-Test	25	110	81	111	22

Direction of Reality ----→

Statement 28. "We should discontinue giving military assistance to dictatorships, for in so doing we increase the ability of the dictator to oppress his own people."

	Washburn	Lawrence	Total Group	Experimental	Control
X^2	2.213			0.015	
z-score	1.447	2.377	2.778	1.981	1.939

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	61	127	61	75	24
Post-Test	46	112	71	97	22

Direction of Reality ----→

Statement 29. "The basic cause for all of our international troubles is Communism."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2		6.521		0.223	
z-score	2.576	0.246	1.449	1.275	0.729

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	53	109	33	112	42
Post-Test	56	91	30	128	44

Direction of Reality ----→

Statement 30. "Ideological goals are secondary to those of national interest and should be considered only if they do not conflict with security and welfare goals."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2		2.282		1.861	
z-score	1.081	0.678	1.143	1.765	0.208

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	19	144	96	80	11
Post-Test	18	144	77	92	19

Direction of Reality ----→

Statement 31. "If we really believed in world peace, we would work toward the formation of a world government."

	Washburn	Lawrence	Total Group	Experimental	Control
x^2	1.185			7.713	
z-score	0.868	0.676	0.145	-1.782	2.157

	Strong Agreement	Agreement	Undecided	Disagreement	Strong Disagreement
Pre-Test	55	99	60	96	39
Post-Test	50	107	65	86	41

Direction of Reality ----→

V. CONCLUSIONS AND IMPLICATIONS.

This section is devoted to a short restatement of the major findings of the project and an examination of some logical extensions of those findings. It also includes some qualitative conclusions and draws attention to some implications for research.

This study provided little statistical evidence to support the hypothesis that the use of simulation in conjunction with other teaching techniques enhances the ability of the student to acquire more factual and conceptual knowledge or to think critically. In fact, the evidence indicates that the control sample performed better on most tests than did the experimental sample. It will be pointed out, however, that there are ample reasons for suspecting that the performance of the control group was not as much better than the experimental group as it might at first appear.

On the pre-content examination, a comparison of the mean scores indicates the experimental group performed better than the control group by 0.7 points (in a total of 102 points.) This does not constitute a statistically significant difference. At the termination of the six-week unit of instruction, the comparison of the mean scores on the same test indicate the control group outperformed the experimental group 53.1 points to 51.4 points, a difference of 1.7. However, approximately two months later when the post-content II examination was administered, the control sample outscored the experimental sample by only 1.4 points, which represented a smaller net loss of knowledge for the experimental group than for the control group. The difference is slight, only 0.4 points. Although this small difference is such that the imprecision of the test tends to make it doubtful, it is worthy of note that there was less loss of information measured for the experimental group than for the control group. This effect pertains even though the experimental group was required not only to learn the same content information as was the control group during the six-week unit of instruction, but it was also required to learn the rules of the simulation game.

The experimental group began the experiment with an overall grade point average 0.03 points lower than that of the control group. On the basis of grades, it is evident that the control group possessed a very small, and probably relatively unimportant advantage over the experimental group. Although the measurements indicated by grade point average and by the content examination are not the same dimensions, it would seem reasonable that the group with the higher grade point average should perform as well or better than the one with the lower average, and that the group with the higher average should probably retain the acquired information at least as well as the other group. In actuality, however, the reverse occurred. The group with the lower grade point average (the experimental group) indicated slightly greater retention of factual and conceptual knowledge on the post-content II examination than did the one with the higher grade point average (the control group).

Although the differences between the two groups are very small, (particularly when it is considered that they were measured with an instrument the precision of which it is doubted can discriminate to 0.1 points for the mean score for a group) it is nevertheless a point of interest that the experimental group did not record as great a loss of knowledge between post-content I and post-content II examination as did the control group. On the pre-content examination, the experimental students in all instances (total experimental, Lawrence experimental, and Washburn experimental) scored higher than did the control group. On both post-content I and post-content II examinations, the control group scored higher in each instance than did the experimental groupings. However, the reduction in the difference between mean scores for the two post-content examinations was less for the total experimental group and for the Lawrence experimental group than it was for the corresponding control groups. There was less net loss indicated for the Washburn control group than for its experimental counterpart, but the N was only 39 for the control group and 49 for the experimental group.

The point that possibly is belabored here is that the experimental group was required to learn more information in the same amount of time (i.e., both the rules of the simulation game and the substantive knowledge of international relations) than was the control group (which was not burdened with the necessity to learn any information other than the substantive knowledge to be tested.) In spite of the difference in the amounts of knowledge to be acquired, the experimental group demonstrated a small superiority over the control group in the amount of knowledge retained after a period of no instruction in international relations. It seems reasonable to suppose that the simulation technique contributed to this result, as all other conditions for the two groups were designed to be identical.

The design of this experiment required that the unit of instruction in which simulation was employed be limited to six weeks duration. This was necessary because initially only a simulation model of international relations was available, and a period of only six weeks was scheduled in the curriculum plan of the two cooperating high schools. As the investigators now review the course of events, it is realized that the experimental group was expected to accomplish academic miracles if it were to learn both simulation and international relations in a period of only six weeks.

The comment might be offered that the requirement to learn the rules of the simulation game was unnecessary as this information is not useful to the student in later life. This argument contends that simulation has no usefulness because it requires the student to learn a "new language" before he can practice the international relations he is supposed to learn. Such a criticism misses the importance of simulation as a technique. The importance of learning that "new language" is equal in importance to learning the rules necessary to operate any complex mechanism. The operations conducted by the students in simulation required them to employ essentially the same skills that they will later employ as citizens of a community. The "new language" is not a useless one, but one of which major elements will be used in the later social and political life of the student.

The difficulty in this experiment was that a relatively complex simulation technique was expected to produce in only six weeks a statistically significant difference in the means scored by various groups on various tests. The demand was too great.

If the simulation technique were employed for a period of an academic year, or for several years, then there would be a reasonable expectation that the technique should produce significantly better mean scores than would be produced by the lecture-discussion method alone. Such longitudinal experiments are now a possibility with the use of a simulation model recently completed by one of the investigators.

Subjective evaluation of the experiment by the investigators and the cooperating teachers indicated conclusively that the students involved in the simulation technique in general obtained greater enjoyment from their classroom experiences than did the subjects of the control group. Those students experiencing simulation became deeply involved in their course of study. According to observations and statements of students in this experiment and others, it is not unusual for students involved in simulation activities to spend a greater amount of time in preparation for those activities than is normally spent in preparation for a similar course in which simulation is not employed. These observations indicate that there is a high level of student involvement when simulation is employed. It also indicates that the students enjoy the activities which take place. This speculation is reinforced by the remarks made by the students of the control group who made frequent comments concerning their disappointment at being deprived of an opportunity to experience simulation.

It is generally considered that educated persons should take interest in the conduct of politics. It is not generally realized, however, that the formative years for political attitudes and interest are between the ages of three and thirteen.[14] The enjoyment obtained by the students engaged in this experiment suggests that some stimulation of political interest could be accomplished if simulation activities were conducted at the lower grade levels. This would provide additional opportunity to achieve the purpose of instruction in the area of social studies skills -- to effect desired changes in behavior.[15]

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[14] David Easton and Robert D. Hess, "The Child's Political World," Midwest Journal of Political Science, VI (August, 1962), 236.

These observations, coupled with previous research such as that of Easton and Hess, support the speculation that the 12th-grade is rather late for the acquisition of the experiences of inter-personal relationships which are accentuated by simulation. It is worthy of developmental study to determine if adequate simulation models and techniques can be developed for use in the elementary grades. If such a program could be developed and administered over a period of several years with the provision of adequate controls and measurements, not only would there be a better possibility of testing the effectiveness of simulation as a teaching technique, but it could also be tested in its effectiveness as a developer of interest and skill in political socialization and related activities.

A comment should be made concerning the type of testing which was employed in this experiment for measuring changes in factual and conceptual knowledge. Both cooperating teachers employed the content examination as the basis for a grade for the unit of instructions on international relations. The content examination was composed of 102 multiple choice items. This type of test is more likely to emphasize to the student the importance of learning facts than of learning the relationship of concepts. It is also likely to test principally the recognition aspect rather than the three higher levels of knowledge described by Ross.[16] It would have been desirable to provide in the original research design that the course grade would be determined by one or more essay examinations, with the students advised that the essay examination would be the basis for the course grade and that the content examination would be used solely for measurements in connection with the research project. In this manner it would have been more likely that the hypothesis could have been tested with reference to that portion which posited that simulation leads to a greater accumulation of conceptual knowledge than does lecture-discussion.

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[15] Dana G. Kurfman and Robert J. Solomon, "Measurement of Growth in Skills," *Skill Development in Social Studies*, Helen McCraken Carpenter, editor (Thirty-third yearbook of the National Council for the Social Studies. Washington: 1963), p. 276.

In connection with the analysis of the content examinations, one interesting but inexplicable finding resulted from the analysis of variance of the interactions of sex, intelligence quotient level, and treatment. In the analysis of gain scores between the post-content I examination and the post-content II examination, an F value significant at the .05 level developed in the sex by treatment interaction. This was the only statistically significant value obtained for any of the sex by treatment interactions for the various tests, but it is interesting to note that in several instances the F value was sufficiently great that there is support for speculation that there is some property of sex in its interactions with the treatments which cannot at this time be clarified. The data indicate, however, that additional research is needed to determine what the relationships may be and their significance.

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[16] C. C. Ross, Measurement in Today's Schools, revised by Julian C. Stanley (3rd edition, New York: Prentice-Hall, Inc., 1954), pp. 166-167.

The results obtained on the critical thinking tests also produced mean scores that were different than had been anticipated. The consistent finding of higher mean scores scored by the control group on the critical thinking tests in comparison with the experimental group was unexpected. There is no ready explanation for this variation from the pattern which was hypothesized. The curious interaction in which the female-high IQ Level and male-low IQ Level groups performed significantly better than the male-high IQ Level and female-low IQ Level groups was particularly disconcerting. It can only be speculated that the male-high IQ Level group customarily performed at or near potential; that the female-low IQ Level group did not become motivated by the simulation experience. Consequently, neither group demonstrated improvement communsurate with that of their corresponding groups. Conversely, speculation suggests that the female-high IQ Level group possessed some skill or interest which evoked performance above that which was customary for this group in this type of subject; the female-low IQ Level group failed to be motivated, and thus did not perform significantly better than was customary. This speculation is weakened, however, by the fact that all groups contained equal representation from the control group and from the experimental group. It remains for further research to produce a suitable explanation for the results obtained on this experiment.

The attitude survey produced numerous significant statistical results. On the basis of the sign test, conducted on the 31 statements contained on the survey, one or both of the null hypotheses should be rejected 18 times, and two additional statements should be rejected on the basis of the chi square test. The attitude test indicated that there was some significant difference between the two schools, although the nature of that difference cannot be determined from the data available. However, the differences between the control group and the experimental group are doubtful as significant statistics were produced approximately an equal number of times for each group. The body of the report contains an analysis of each of the statements for which a significant value was achieved on the sign test.

The findings of this research project are far from conclusive on any of the tests. The control group, in general, performed better than did the experimental group on the tests which were designed to measure acquisition and retention of factual and conceptual knowledge and the enhancement of the ability to perform critical thinking. The attitude survey did not produce the pronounced difference between the two groups that it was hypothesized would occur. The project raised more questions than it answered.

The most important question concerns the role which simulation plays in a learning situation. Is simulation only a device which is employed by a teacher who possesses a great desire to stimulate his students? In other words, is the student stimulation noted by the investigators only the result of a teaching technique which a stimulated teacher employs, and the result is to stimulate the students? Or is simulation a valid technique by which students are enabled to acquire complex skills useful in the solutions of problems presented in social processes? The answer to both questions is probably a qualified affirmative.

The current project has provoked questions which provide a definite indication of the need for a study on a longitudinal basis. Such a study is required to develop the simulation models which will reproduce in satisfactory microcosm the multitude of social processes in which the modern student must find understanding and competence. There is also a requirement that satisfactory instruments be developed to measure the changes which occur in a student as a result of his participation in a learning process which employs simulation as a part of its program.

Two observations by the investigators are considered of particular interest. (1) The students who engaged in the simulation experiences appeared to derive real enjoyment from the exercise and to become deeply involved in the artificial environment of which they were temporarily a part. (2) Those students who were members of the control group and did not participate in simulation periods appeared to be disappointed that they were deprived of the opportunity to experience what to them was apparently an exciting means of learning the substantive material of international relations which they were studying.

Some recent research has indicated that when a learner is placed in a ". . . learning situation where some novel learning is undertaken, classical-conditioning learning then takes the form of an S-shaped curve . . . ."[17] It is tempting to postulate that simulation affords an opportunity for experiencing novel learning, and that once the requisite skills had been acquired the mean learning curve of those participating in simulation would ascend more rapidly than the corresponding curve of the non-participants. With the development of instruments to measure adequately the acquisition of knowledge and skills, such learning curves could be plotted and data could be secured concerning the effect of recency, frequency, and repetition of material. Such a program should encompass a minimum of one academic year, and preferably it should include several consecutive years.

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[17] Robert M. W. Travers. Essentials of Learning: An Overview for Students of Education (New York: The Macmillan Company, 1963), pp. 284-285. See also Bernard Berelson and Gary A. Steiner, Human Behavior: An Inventory of Scientific Findings, (New York, Chicago, Burlingame: Harcourt, Brace & World, Inc., 1964), pp. 157-168.

As previously stated, the students who participated in the simulation experiment became highly involved in the learning situation. It cannot be denied that the students in the control group also displayed interest, but not to the degree that did the students of the experimental group. It is also believed reasonable to speculate that the experimental group did not perform as well on the various tests as did the control group because of the necessity to acquire the skills required to operate the simulation model. However, if the simulation experience had been continued for a longer period of time (and if learning curves could have been plotted for both groups) it is quite possible that the learning curve of the experimental group (although it did not ascend as high at the end of six weeks) would have begun to ascend at an accelerated rate after a reasonable period, and that it would have leveled off at a higher level than that of the control group after the removal of the stimulus.

Although these concluding paragraphs have been speculation, they are predicated upon close observation and frank, detailed discussions with the students involved in this project as well as others, both those in high school classes and those in college. There is no question that this project provided a stimulating environment for the students of the experimental group, and importantly, for the teachers and the investigators. It is also obvious that the control group was tainted with the "Hawthorne effect" because of the impossibility of providing an adequate control group with the facilities available at the beginning of the experiment. But regardless of its shortcomings and the absence of statistical support, it was readily apparent that the experimental group experienced a learning situation that it enjoyed, one from which it profitted, and one which was the envy of the control group.

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APPENDIX A

INSTRUCTION SCHEDULE

EXPERIMENTAL GROUP	CONTROL GROUP
FIRST WEEK: January 25-29	
Monday-----Content Exam	Content Exam
Tuesday----Cornell Exam	Cornell Exam
Wednesday--Watson-Glaser	Watson-Glaser
Thursday---Attitude Exam. Allow students to rank top leaders for CDMs. Explanation of simulation.	Attitude Exam
Friday-----Pick CDM and the rest of the team (CD and MA). Assign countries. Give out intelligence report on countries. Explanation of the rules.	Assignment (two of the below sources). Chapter 17, American Govt. Magruder, "State Dept." Chapter 25, Our Living Govt., International Relations. Our American Foreign Policy, Chapter 1-4, Foreign Research Series. Pass out "Ideology" and "Communism" outlines. Lecture on "Formulation of U.S. Foreign Policy" and "How U.S. Foreign Policy is Made".
SECOND WEEK: (No wars the first week of the simulation) February 1-5	
Monday-----Simulation	Finish lectures on Foreign Policy.
Tuesday----Simulation	Great Decisions: "World Communism".
Wednesday--Simulation	"Communism in Theory and Practice".
Thursday---Evaluation of the first three days of simulation. Formulation of U.S. Foreign Policy. Pass out "Ideology" and Communism" outlines.	"Communism in Theory and Practice".
Friday-----Great Decisions: "World Communism".	Lecture - "Power" and "Balance of Power". Students submit page of notes on 30 pages of outside reading.

	EXPERIMENTAL GROUP	CONTROL GROUP
THIRD WEEK: February 8-12		
Monday-----	Simulation	Finish lecture on "Power" and "Balance of Power".
Tuesday----	"Communism in Theory and Practice".	Great Decisions: "France and the West".
Wednesday--	Simulation	"Nationalism"
Thursday---	Great Decisions: "France and the West". Finish lecture on "Communism". Start lecture on "Power" and "Balance of Power".	"Diplomacy" and "The Modern State".
Friday-----	Simulation. Students submit page of notes on 30 pages of outside reading.	Great Decisions: "Middle East". Students submit page of notes on 30 pages of outside reading.
FOURTH WEEK: February 15-19		
Monday-----	Simulation	Lecture - "Alliances and Collective Security".
Tuesday----	Great Decisions: "Middle East".	Great Decisions: "Disarmament".
Wednesday--	Simulation. Finish lecture on "Power" and "Balance of Power".	"International Disputes".
Thursday---	"Nationalism, Diplomacy, Modern State System"	"International Law"
Friday-----	Simulation. Last ten minutes: lecture. "Alliances and Collective Security". Students submit page of notes on 30 pages of outside reading.	Complete all lectures. Student report and panels. Reading period. Students submit page of notes on 30 pages of outside reading.

EXPERIMENTAL GROUP	CONTROL GROUP
FIFTH WEEK: February 22-26	
Monday-----Simulation	"Imperialism"
Tuesday----Great Decisions: "Disarmament".	Great Decisions: "Castro's Cuba".
Wednesday--Simulation	Class discussion on Viet Nam.
Thursday---Great Decisions: "Castro's Cuba".	Great Decisions: "Indonesia".
Friday-----Simulation	"Collective Security", (SEATO and America's policy toward Asia). Discussion on other collective security arrangements.
SIXTH WEEK: March 1-5	
Monday-----Simulation	Lecture on "Foreign Aid".
Tuesday----Great Decisions: "Indonesia".	Lecture on "Foreign Aid".
Wednesday--Simulation	Great Decisions: "Foreign Aid".
Thursday---Great Decisions: "Ideological Warfare".	"International Organizations".
Friday-----Simulation	Population problem
SEVENTH WEEK: March 8-12	
Monday-----Simulation	Population problem
Tuesday----Foreign Aid Lecture and lecture on population.	"Propaganda"
Wednesday--(No school because of snow.)	(No school because of snow.)
Thursday---Great Decisions: "Foreign Aid".	Great Decisions: "Ideological Warfare".
Friday-----Simulation. Population Problem.	"Political Hotspots" (Applied concepts).

EXPERIMENTAL GROUP	CONTROL GROUP
EIGHTH WEEK: TESTING WEEK March 15-19	TESTING WEEK
Monday-----Simulation	Reviewed concepts. "Political Hotspots".
Tuesday----Cornell Test	Cornell Test
Wednesday--Watson-Glaser Test	Watson-Glaser Test
Thursday---Attitude Survey Test	Attitude Survey Test
Friday-----Content Exam	Content Exam

APPENDIX B

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KANSAS STATE TEACHERS COLLEGE

Division of Social Sciences

RESEARCH PROJECT G-65

Content Examination

by

Dale M. Garvey, Thomas O'Dell, and Donald A. Binns

INSTRUCTIONS: Each of the following questions is to be answered by selecting the ONE answer which you consider the BEST answer. Mark your selection on the answer sheet by making a (X) in the appropriate space for each question.

1. The Gross national product of the Soviet Union in comparison with that of the United States is approximately (1) 50%, (2) 65%, (3) 80%, (4) 95%.

2. The Soviet Unions' economic answer to the European Common Market was the establishment of the (1) Warsaw Pact, (2) Cominform, (3) Comecon, (4) "Great Leap Forward."

3. During the 1950's and 1960's, the Achilles' heel of the Communist system has been (1) military equipment, (2) industrial production, (3) agriculture, (4) bureaucracy.

4. The Soviet Union has approximately (1) 3, (2) 10, (3) 25, (4) 70, million enrolled party members.

5. Communist labor unions are considered strong in all of the following countries EXCEPT (1) France, (2) Italy, (3) Indonesia, (4) India.

6. Communist China is more revolutionary than the Soviet Union because (1) of immediate food and population problems, (2) of surrounding imperialistic powers, (3) they follow the Marxist-Leninist line or doctrine, (4) they believe their position will have greater appeal to the less developed countries.

7. What is the purpose of the United States foreign assistance program? (1) Enlightened self-interest, (2) humanitarianism, (3) part of a bi-polar struggle for world power, (4) all of these.

8. A number of countries with a total of more than a billion population have won their independence during the last forty years. The United States is in the midst of this world revolution which has been caused by (1) the population explosion, (2) the communist strategy of world domination, (3) the arms race, (4) the breaking down of traditional institutions and cultural patterns.

9. The term "Grand Design" refers to (1) a proposal by de Gaulle for political federation of the western European nations, (2) a plan to retain European concepts of nationalism, (3) a plan to unite all the countries of Europe and Asia, (4) none of these.

10. The Grand Design is based on (1) a concept of the interdependence, politically and economically, of the western European nations, (2) the approval of Russia, (3) the exclusion of the U.S. from world affairs, (4) the fact of political unity in western Europe.

11. France's de Gaulle (1) supports the concepts of the Grand Design, (2) prefers West Germany and France as leaders of European fate, (3) welcomes U.S. influence in European affairs, (4) wants England in the European Common Market.

12. The major goal of the Grand Design would be (1) to spur economic growth and to liberalize the terms of international trade through the progressive reduction of tariffs, (2) to align monetary policies, (3) to share the burden of defense and to aid the underdeveloped nations and regions, (4) all of these.

13. The foremost critic of the Grand Design is, (1) Enver Hoxha, (2) Mao Tso-tung, (3) Dean Rusk, (4) none of these.

14. In 1957, six countries signed the Treaty of Rome creating (1) NATO, (2) the Grand Design, (3) the Organization for European Economic Cooperation and Development, (4) the European Economic Community.

15. The Grand Design is an attack upon (1) poverty and lack of education in Asia, (2) the old concepts of power politics, (3) nationalism, (4) all of these.

16. One of the following views the nation-state system as the highest form of political organization. (1) Charles de Gaulle, (2) Walter Ulbricht, (3) Harold Macmillan, (4) Yevgeny Yevtushenko.

17. The "new wave" is a trend describing the (1) intellectual and artistic movement in the Soviet Union, (2) influence of young Chinese cadre members in Southeast Asia, (3) population growth in the underdeveloped countries, (4) marxist theory of surplus value in underdeveloped countries.

18. All of the following reveal seeds of dissent between the Soviet Union and Red China, EXCEPT (1) support of Fidel Castro, (2) border disputes, (3) Khrushchev's denunciation of Stalin, (4) reduction of trade between the two countries.

19. The United States favors all of the following EXCEPT (1) the development of independent nuclear forces by its allies, (2) British acceptance of Polaris missiles instead of the Skybolt, (3) a multilateral NATO fleet, (4) closer economic ties with the European Economic Community.

20. In 1962, the tariff difficulties between the United States and the Common Market countries were revealed in the (1) increased rates on capital goods, (2) chicken war, (3) decrease in automobile rates, (4) decrease in exports to the United States.

21. What event established Gamal Abdel Nasser as the leader in the cause of Arab nationalism? (1) The overthrow of King Farouk's corrupt government, (2) the result of the Suez crisis of 1956, (3) the increased respect gained by him at the Bandung Conference in 1955, (4) his creation of the Free Officers committee.

22. United States interest in the Middle East includes all of the following EXCEPT (1) oil, (2) freedom of passage through the Suez Canal, (3) uranium deposits, (4) air bases.

23. The capital city of Indonesia is (1) Port Timor, (2) Djakarta, (3) Saigon, (4) Java.

24. All of the following are countries of Southeast Asia EXCEPT (1) Thailand, (2) Kenya, (3) Burma, (4) Cambodia.

25. Which of the following countries and leaders is matched incorrectly? (1) Ben Bella of Tunisia, (2) Emperor Haile Selassie of Ethiopia, (3) Moise Tshombe of Congo, (4) Jomo Kenyatta of Kenya.

26. In the Middle East, rivalry between "progressive" Nasserites and "conservative" monarchists has been further complicated by the development of the (1) Baath Party, (2) Wafd Party, (3) Muslim Brotherhood, (4) Green Shirts.

27. Who is the author of the pamphlet entitled The Philosophy of the Revolution? (1) Gamal Abdel Nasser, (2) Marshall Tito, (3) Mao Tse-tung, (4) Patrice Lumumba.

28. The per capita annual income of Egyptians is approximately (1) $125, (2) $350, (3) $575, (4) $950.

29. All of the following are part of Nasser's internal reforms EXCEPT (1) a decrease in income tax, (2) allowable landholding reduced, (3) government monopoly in cotton, (4) companies will be required to have one representative of the managerial staff and workers on the board of directors.

30. The following are all characteristics and/or examples of Arab disunity, EXCEPT (1) civil strife in Yemen, (2) the feeling of family or tribal loyalty, (3) the destruction of Israel, (4) the attitude of Egypt and Algeria toward President Bourgiba.

31. Gamal Abdel Nasser's chief weakness as a leader is (1) his distrust of politicians and parties, (2) his lack of personal magnetism in the Middle East, (3) his distrust of fanatical religious leaders, (4) his complete loyalty to Egypt as opposed to Arab unity.

32. The basic aim of a statesman in the use of diplomacy is to (1) embarrass, (2) gain time, (3) compromise and solve real issues, (4) all of these.

33. Demography is the study of (1) geography as a factor in the development of democracy, (2) population, (3) distribution of democratic countries according to geography, (4) all of these.

34. It has been estimated that approximately (1)1/4 (2)1/2 (3) 3/4, (4) 2/3, of the people in the world do not receive a sufficient number of calories each day.

35. One factor generally found lacking in communist nations, as compared to constitutional democratic countries, is (1) a well-educated ruling class, (2) a broad middle-class, (3) rich deposits of minerals, (4) poor transportation and communications.

36. The Communist Manifesto includes all of the following EXCEPT (1) the concept of a class struggle, (2) the theory of wages, (3) concentration of wealth, (4) concept of a well-organized core of trained revolutionaries.

37. Marx borrowed the concept of the dialectic from (1) Hegel, (2) Spencer, (3) Engel, (4) Proudhon.

38. Ideology could be defined as a (1) cluster of values, beliefs, and myths adhered to by a group of people, (2) concept concerned with the question of "why" and lacks emotional attachment, (3) concept describing the relationship between opposing ethnics, socio-economic, and religious groups, (4) all of these.

39. What type of power did the United States use in the Cuban crisis? (1) Economic, (2) political and psychological, (3) military, (4) all of these.

40. The United States in granting and/or lending money to less developed countries should first consider if its aid (1) guarantees reliance on private enterprise, (2) strengthens its foreign military capabilities, (3) brings it friends, (4) promotes stable societies which are capable of rapid change without violence.

41. All of the following factors have intensified international relations, EXCEPT (1) nationalism, (2) international organizations, (3) technological development, (4) sovereignty.

42. What man was considered the "father of international law?" (1) Richard Souche, (2) Hugo Grotius, (3) Polybius, (4) John Locke.

43. Karl Marx believed in all of the following EXCEPT (1) man is the highest of all beings, (2) the most successful communist revolutions would eventually take place in agrarian societies, (3) man is a product of existing historical forces, (4) that institutions are creations of the bourgeoisie.

44. What factor allowed the United States to enforce the Monroe Doctrine during the 19th century? (1) Geography, (2) change in Europeans' attitude toward diplomacy, (3) balance of power in Europe, (4) all of these.

45. Recognition of a new nation is the responsibility of the (1) Congress, (2) State Department, (3) President, (4) Senate.

46. The "Political Manifesto" or MANIPOL of Indonesia included all the following principles EXCEPT (1) guided democracy under Sukarno, (2) the rejection of the communist party under D. N. Aidit and glorification of the past, (3) return to the 1945 Constitution, (4) guided economy and Indonesian identity.

47. To date, Sukarno has been able to solve the problem of the (1) growing foreign debt, (2) Malaysia dispute, (3) West Irian dispute, (4) rising budget deficits.

48. All of the following are problems confronting Indonesia EXCEPT (1) imports of rice, (2) lack of resources, (3) outer islands, (4) inflation.

49. The underlying cause of instability in the Middle East includes all the following EXCEPT (1) poverty and illiteracy,

(2) national and tribal rivalries, (3) lack of ethnic majorities, (4) the conflicting interest of foreign powers.

50. The United States with 7% of the world's population consumes (1) 40%, (2) 50%, (3) 60%, (4) 80% of the oil production of the world.

51. Which of the following is the author of the book What Is To Be Done? (1) Maxwell D. Taylor, (2) V. I. Lenin, (3) John F. Kennedy, (4) Winston Churchill.

52. De Gaulle's plan for Europe is (1) acceptable to the U.S., (2) to establish Western Europe as an independent force in world affairs, (3) supported by other Western European nations, (4) all of these.

53. Exclusion of England from the European Common Market is (1) favored by Western European countries, (2) accepted by the U.S., (3) a part of de Gaulle's plan to strengthen Europe, (4) of no economic or political consequence.

54. NATO is an organization to (1) provide for comprehensive defense of Western Europe, (2) plan for a division of military tasks between Western European nations and the U.S., (3) provide a false sense of security to Western Europe, according to de Gaulle, (4) all of these.

55. The Council for Mutual Economic Assistance (1) determines the war strategy of the Communist bloc, (2) attempts to integrate the economies of Russia, Mongolia and the Eastern European Communist bloc nations, (3) is the economic parallel to NATO, (4) was established by President Truman.

56. State planning of the economy in Russia and its bloc countries is (1) successful, (2) recognized as the only basis for determining economic production, (3) lacks the basic ingredient of economic production -- incentive, (4) all of these.

57. Communist China is (1) pro-Stalinist in practice, (2) less militant than Russia toward the West, (3) economically more successful than Russia, (4) no serious threat to the western world.

58. The Middle East is characterized by (1) political harmony, (2) intense nationalism, (3) total support for the Western world, (4) acceptance of Israel as a country.

59. The United Arab Republic is an attempt to (1) provide both Arab unity and nationalism as a basis for an all-inclusive

Arab government, (2) eliminate Zionism, (3) eliminate colonialism, (4) all of these.

60. The U.S., and particularly Western European countries, are concerned about the Middle East because of (1) its natural resources, (2) Suez Canal, (3) the possibility of Communist domination of the area, (4) all of these.

61. The basic problem involved in disarmament is (1) mutual distrust, (2) the powerful nation's economies are geared to production of military equipment and supplies, (3) lack of means of self-defense, (4) the powerful munitions lobbies.

62. The official U.S. position on the test ban treaty is (1) that large-yield nuclear bombs are of no particular advantage, (2) that the treaty will not retard the development of new weapons, (3) that the testing program will not be abandoned, (4) that any testing in outer space or in the atmosphere can be detected.

63. Castro's revolution in Cuba is unlike other Communist revolutions in that (1) it was accomplished by force, (2) it had the support of the peasants and working class, (3) it was aided by other Communist countries, (4) all of these.

64. The Cuban economy survives because (1) of the methods of production used, (2) the wider world market secured by Castro, (3) of Soviet Russian aid, (4) of support from other Latin American countries.

65. The term "monolithic unity" describes (1) the United Nations, (2) the first 20 years of the world communist movement, (3) the Western European nations, (4) none of these.

66. The 1956 Hungarian revolution was (1) communist inspired, (2) ignored by the Russians, (3) a result of liberalization of certain features of Soviet life, (4) successful.

67. The present communist bloc is composed of (1) two powerful and many less powerful nations, (2) countries only in Eastern Europe, (3) fewer people than the western world, (4) none of these.

68. Economic production in communist bloc countries is concentrated in (1) heavy industry, (2) the production of consumer goods, (3) providing the population with a higher standard of living, (4) internal improvements.

69. Nations sometimes impose tariffs upon those goods which are imported from another nation. Such tariffs (1) tend to

stimulate international trade, (2) serve as a hindrance to international understanding, (3) indicate that a nation does not believe it necessary to protect its own industries and producers, (4) are of no concern in the conduct of international relationships.

70. It is apparent from a study of the philosophy by which totalitarian and democratic states are governed that (1) totalitarian states place emphasis upon the development of national strength, (2) democratic states place their emphasis upon the improvement of the standard of living, (3) both of the above, (4) neither of the above.

71. The tensions which have been demonstrated between Red China and the USSR are indicative that (1) the basic disagreement between them concerns the interpretation of Marxist theory, (2) their relative political power is of little significance, (3) it is much more difficult today for nations to coexist in the world, (4) nations seek power, not friends.

72. When nations are uncertain of the intentions and objectives of other nations with which they share tensions and conflict, it is likely that (1) peace will be maintained because each nation is uncertain of its own objectives, (2) tensions will ease in the long-run, (3) tensions will increase as each nation seeks to overcome its uncertainty, (4) war is almost certain to develop.

73. If you were a Russian political leader, and you used the term "co-existence", you would mean (1) each nation of the world would continue to exist in its own way, peaceably and without conflict, (2) non-communist nations could continue to live in their own way until the USSR was ready and capable of controlling them, (3) communist nations would seek to live peaceably with non-communist nations, but eventually the capitalist nations would be overcome, (4) communist nations would seek to live peaceably, provided the capitalist nations permitted them to do so.

74. Which of the following statements best define "nationalism"? (1) a world government, (2) a concept pertaining to relations of the communist nations, (3) a nation's desire to participate with other nations to preserve peace, (4) a feeling of belief and pride in one's own nation.

75. The "Revolution of Rising Expectations" refers to (1) the Cold War, (2) the lessening of tension in the world, (3) the political situation in Asia, (4) the underdeveloped nations of the world.

76. "Dollar Diplomacy" refers to (1) the international monetary exchange, (2) diplomacy aimed at getting more money for the U.S., (3) using American wealth in the effort to persuade other nations to cooperate with the U.S., (4) a conscious display of wealth in an effort to impress other nations.

77. Underdeveloped nations are so-called because of which of the following: (1) a lack of cultural development, (2) an underdeveloped economy, (3) a failure to maintain a good standard of living, (4) a nation lacking military strength.

78. To be a great power in the modern world, the most important single attribute that a nation must have would be (1) to have a large navy, (2) to be a colonial power, (3) to be industrialized, (4) to be militaristic.

79. Which of the following is LEAST CHARACTERISTIC of the relations of nations with one another? (1) The use of diplomacy in settling affairs of mutual concern, (2) recognition of an authority higher than that of a nation, (3) attempts to maintain a balance of power, (4) the use of force as a means of achieving national goals.

80. Reciprocal trade agreements have as their purpose (1) the prevention of goods of unfriendly nations being sold on the world market, (2) the mutual reduction of tariffs on goods exchanged between two countries, (3) a mutual increase of tariffs in an endeavor to stimulate trade and to increase national revenues.

81. International law differs from domestic law because it (1) evolves from custom, (2) is not subject to judicial interpretation, (3) lacks the sanction of police power, (4) is not written.

82. A sovereign state is one which (1) has a strong sense of national unity, (2) has a sovereign or king as a ruler, (3) has a democratically selected government in which the people are sovereign, (4) is politically independent.

83. If one compares the dictator of a totalitarian regime with the head of government of a democratic state in reference to the freedom they possess to make sudden and major changes in national policy, (1) the leader of a democratic state would have greater freedom of choice, (2) the dictator would be less likely to undertake violent changes of policy, (3) the democratic leader would not be susceptible to the pressures of allied states, (4) the dictator would not be subject to the restrictive pressures that would operate on a democratic leader.

84. In the development of nations, there is a demonstrated desire to possess military forces because such forces lend

prestige to the developing nation. In addition, the maintenance of military forces (1) is necessary to the defense of such developing states, (2) is a heavy burden upon the state, in an economic sense, (3) is of little significance, (4) is a policy which developing states should be encouraged to adopt.

85. If one compares a totalitarian state and a democratic state, one would find that (1) there is less opportunity for education in a totalitarian state, (2) there is greater emphasis in the democratic state upon the obligations which the citizen owes to the state, (3) there is less requirement for the totalitarian state to respond to the desires of consumers, (4) there is a great difference in the pressures exerted upon the citizen to conform to the standards set by society.

86. If one compared the economics of a developing nation and a highly industrialized nation, it would be noted that (1) the rate of growth of the developing nation would probably be greater, (2) the economy of the developing nation would be less likely to feel the burden of military expenditures, (3) the rate of growth of the industrialized nation would be greater, (4) the highly industrialized nation would have placed a greater portion of its effort into the development of heavy industry.

87. It is considered to be a truism, but sometimes we forget that (1) the nations of the world are interdependent, (2) each nation of the world is sovereign, and therefore master of its own fate, (3) nations engage in international trade and diplomatic relations solely for their own benefit, (4) the stronger the nation, the less interest it has in other nations.

88. Which of these would be most in harmony with the "balance of power" concept in international relations? (1) Collective security, (2) an international police force, (3) compulsory arbitration of international disputes, (4) defensive alliances.

89. The conduct of trade between nations (1) is likely to result in the lowering of international tensions, (2) creates suspicions in each nation that the other is getting the best deal, (3) arouses antagonism as each nation competes for markets with other nations, (4) is a matter of equal advantage.

90. Nations frequently seek to build alliances. Once alliances are constructed (1) there is no necessity to review and revise their objectives, (2) they will continue to function for the period stated in the treaty that established them, (3) they begin to crumble as soon as the initial objectives are achieved, (4) require continual efforts on the part of each member to keep the organization relatively free of tensions.

91. The United States has spent many billions of dollars for foreign assistance to other nations. Foreign assistance, both military and economic, is designed to be (1) a means of enabling the United States to achieve its foreign policy objectives, (2) a means of persuading foreign nations to like the United States, (3) a means of enabling the poor foreign nations to carry on trade with the United States, (4) a means of developing future markets for the United States.

92. Nations have as one of their primary purposes the provision for their citizens of adequate security against foreign attack. Security for each nation can best be obtained by (1) providing adequate military forces, (2) constructing numerous alliances, (3) developing common interests with other nations, (4) avoiding entangling alliances with other nations.

93. In the United States, the integration of its foreign policy is the responsibility of (1) the Bureau of the Budget, (2) the United States Information Agency, (3) the Central Intelligence Agency, (4) the National Security Council.

94. The formulation of American foreign policy is dominated by one central and overriding fact: (1) we exist in a world of independent and sovereign nations, (2) our obligations to the North Atlantic Treaty Organization, (3) intense public concern over American participation in the United Nations, (4) the almost complete authority of the executive branch of government.

95. A major roadblock in the way of foreign policy makers of the United States is often (1) the cool relationship between the president and Secretary of state, (2) the unusual concern of the public with international affairs, (3) the principle of checks and balances, (4) the powers of the state governments.

96. A major advantage of vesting wide powers in the president for the purpose of achieving a democratic foreign policy would be (1) the Congress might then criticize freely and without responsibility, (2) interest groups would be prevented from achieving their selfish goals at the expense of the security of the nation, (3) real leadership would be provided by an elected official who faces the public often enough to be controlled, yet not often enough so that he must follow an uninformed public, (4) the budget could more easily be balanced.

97. All of the following accurately describe foreign-policy making in the United States EXCEPT (1) Congress and the president both have important roles to play, (2) Congress

rather than the president, is better equipped to take the initiative in foreign-policy making, (3) the Secretary of State is the president's chief adviser in foreign-policy making, (4) in actual practice the Secretary of State formulates a great deal of foreign policy himself and then secures the president's backing.

98. All of the following describe the behavior of political parties in foreign-policy making EXCEPT (1) parties are reluctant to play major roles because Americans generally prefer to keep foreign policy out of politics, (2) parties take even less clear and candid stands on foreign policy than they do on domestic issues, (3) congressional voting indicates that on some foreign policy issues significant differences exist between the major parties, (4) voting the "party line" in foreign policy matters is always paramount over sectional and economic interests.

99. "Bipartisanship" in the making of foreign policy means all EXCEPT one of the following: (1) collaboration between executive and congressional foreign policy leaders of both parties, (2) clearcut debates on foreign policy issues in political campaigns, (3) support of both parties in Congress for whatever the current foreign policy may be, (4) sharing of responsibility by both parties for foreign policy decisions and their consequences.

100. The threat posed by nuclear weapons and their ability to devastate large areas and to destroy large numbers of people has led to the contention that in the 1960's, peace is maintained by (1) a balance of power, (2) a preponderance of military force, (3) a balance of terror, (4) withdrawing from those areas of the world in which danger of war is present.

101. Soviet Russia and Communist China disagree on (1) the goals of communism, (2) the needs of the communist peoples, (3) the tactics to be used in achieving world communism, (4) the importance of Marxism-Leninism.

102. In 1947, Turkey and Greece were threatened by Communist expansion. The United States supported these countries with aid, known as the (1) Marshall Plan, (2) Point Four Program, (3) Truman Doctrine, (4) none of these.

APPENDIX C

CORNELL CRITICAL THINKING TEST, FORM X

by Robert H. Ennis and Jason Millman

Exploring in Nicoma

The year is 1990. It is the middle of June. Imagine yourself to be in the second group from the United States to land on the newly-discovered planet, Nicoma. Nothing has been heard from the first group, which landed on Nicoma two years earlier. Your group is going to investigate and bring a report back to earth.

In what follows you will be told about the investigation. Then you will be asked questions that call for clear thinking. Answer these questions as if the facts given were true.

Do not guess wildly at these questions. If you have no idea what the answer is, omit the question. If you have a good idea, even though you are not positive, answer the question.

This test takes fifty minutes. You will be able to finish, if you do not spend too much time on any one question. Work carefully, because in the first two sections you must not go back to an item once you have passed it.

Now take your answer sheet and print your name and the other information requested.

Wait for your teacher to tell you to begin.

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Experimental Edition

Part I, Section A - What Happened to the First Group?

The first job of your group is to find out what happened to the first group of 15 explorers. Your group has landed on Nicoma and has just discovered the metal huts put up by the first group. The huts appear to be in good condition from the outside. It is a warm day and the sun is shining. The trees, rocks, grass, and birds make this part of Nicoma appear about like parts of central United States.

You and the health officer are the first to arrive at the group of huts. You call out, but get no answer.

The health officer suggests, "Maybe they're all dead." You investigate.

Below are listed a number of facts which you learn. For each fact you must decide if it would be evidence for, or evidence against, the health officer's idea that they are all dead. However, the fact might not be either.

For each fact, mark one of the following on your answer sheet:

A. This fact is evidence in support of the health officer's idea that they are all dead.

B. This fact is evidence against the health officer's idea that they are all dead.

C. Neither, Discovery of this fact makes no difference.

Here is a sample:
1. You go into the first hut. Everything is covered by a thick layer of dust.

This fact is evidence in support of the health officer's idea. It certainly is not enough to prove his idea, but is evidence for it. Using the special pencil, blacken the space under A for number 1 on your answer sheet--like this:

	A	B	C
1	▮	⁞	⁞

Here is another example:
2. Other members of your group discover the first group's rocket ship nearby.

What do you say about that fact? Mark your answer by number 2 on your answer sheet. Do it now.

Go on to the next page.

You should have marked C. This fact about the rocket ship does not help us decide whether the members of the first group are dead. If you did not mark C, erase your mark thoroughly and mark C.

Here is a list of facts. For each one mark A, B, or C. If you have no idea which to mark, leave that one blank and go on to the next one. Consider the bearing of each fact at the time that it becomes known. Do so in the order in which they are numbered. Work slowly and carefully, and do not return to an item once you have left it. Reminder--mark as follows:

A. This fact is evidence in support of the health officer's idea that they are all dead.

B. This fact is evidence against the health officer's idea that they are all dead.

C. Neither.

3. There are ten huts. You go into the second hut and again find that everything is covered by a thick layer of dust.

4. You go into the third hut. There is no dust on the cookstove.

5. You find a can opener by the cookstove in the third hut.

6. In the third hut you find a daily record of the activities of a member of the first group. It is written by a man named John Stilltron. The date of the last entry, July 2, 1988, is one month after the arrival of the first group.

7. You find that the two beds in the third hut are covered with a thick layer of dust.

8. You read the first entry in Stilltron's record: "June 2, 1988. We arrived today after a tiring trip. We put up the huts near our landing place."

9. You read the second entry in Stilltron's record: "June 3, 1988. There is a plentiful supply of food. Ducks, squirrels, and deer are here and are easily caught."

Go on to the next page.

10. You read the third entry in Stilltron's record: June 4, 1988. The water in the nearby stream has been tested by our health official. He has declared it safe to drink. We are not drinking it yet. We're going to try it with some guinea pigs we brought from the earth."

11. You read the last entry in the book: "July 2, 1988. I am getting weaker and can't hold out much longer."

12. In different handwriting below the last entry, you read, "John Stilltron died the same day."

13. The health officer has now looked in each of the ten huts. He reports that there is a thick layer of dust in each of them.

14. You proceed to examine the beds in each of the first three huts. You find that in each case the blankets and sheets are stripped from the beds and folded neatly in the closets.

Reminder--mark as follows:

A. This fact is evidence in support of the health officer's idea that they are all dead.

B. This fact is evidence against the health officer's idea that they are all dead.

C. Neither.

15. The health officer reports that the beds in all the other huts are in the same condition. The blankets and sheets are neatly folded in the closets.

16. You notice a mound of earth behind Stilltron's hut. You examine it and find a stone with this inscription: "John Stilltron. July 2, 1988. He died as he lived--with honor."

17. The truck possessed by the first group is missing.

18. You investigate in the tenth hut and find a note dated March 15, 1990:

> If anyone should come looking for us, we have all gone exploring in the truck. We plan to head in the direction of the sunrise. (Signed) Captain Sardus, Leader of the Nicoma Explorers.

Go on to the next page.

19. You see a note added at the bottom:

    P.S. We plan to be back within a week.

20. Eight members of your group get in one of your group's trucks and head in the direction of the sunrise. You follow a rough broad valley for 20 miles and find the first group's truck apparently abandoned by a stream.

21. You discover a note in the driver's seat:

    Engine breakdown. We plan to hike downstream. Perhaps there's a large body of water in that direction. (Signed) Captain Sardus.

22. One of the eight, who is a mechanic, examines the abandoned truck's engine. He declares that it is in bad condition.

23. You observe that the truck's front tires are flat.

24. You start to drive downstream, since the land is level and clear. After 10 miles of driving, you see smoke rising in the distance. So far as you know, there are no volcanoes on Nicoma.

25. You soon come to a cliff too sharp for the truck. So all eight of you get out and walk toward the smoke.

It grows dark, so you camp overnight. You set out again in the morning. After walking for an hour, your party comes upon an empty village of stone huts. The sun is shining brightly. Various pieces of information are presented to you, since you are the leader of the party.

In what follows you will be given pieces of information, two at a time. You must decide which, if either, is more reliable. For each pair mark as follows:

A. The first is more reliable.
B. The second is more reliable.
C. They are equally reliable or unreliable.

Here is an example: (The information is underlined in each case)

26. A. The auto mechanic investigates the stream by the village and reports, "The water is not safe to drink."

    B. The health officer says, "We can't tell yet if the water is safe to drink."

Go on to the next page.

C. Equally reliable or unreliable.

What answer did you mark? You should have marked B. The underlined material in B is more dependable than the underlined material in A.

Here are some more pairs. Consider each pair in order at the time the information is offered.

27. A. The mechanic says, "The water looks clear."

B. The health officer, after making tests, says, "The water is good to drink."

C. Equally reliable or unreliable.

28. A. The health officer says, "This water is safe to drink."

B. Several other men are soldiers. One of them says, "This water supply is not safe."

C. Equally reliable or unreliable.

29. A. One soldier looks at some smoke rising. The smoke appears to him to be just behind the largest hut, which is on a hill about 100 yards away. He concludes, "The source of that smoke must be about 100 yards away."

B. Another soldier, who has just been behind the largest hut, says, "Oh no, the source is much farther than that."

C. Equally reliable or unreliable.

Reminder--mark as follows:

A. The first is more reliable.
B. The second is more reliable.
C. They are equally reliable or unreliable.

30. A. The mechanic has made a quick round of the stone huts and heard a noise in the nearest hut. "There must be someone in that hut," he reports.

B. The health officer, who was in the nearest hut for several minutes reports, "Nobody is in that hut."

Go on to the next page.

C. Equally reliable or unreliable.

31. A. The health officer concludes on the basis of his examination of the nearest hut, "The first group of explorers probably built that hut."

B. The anthropologist (a specialist in the study of races, tribes, and civilizations) also examined the nearest stone hut. He states, "The first group probably did not build the hut."

C. Equally reliable or unreliable.

You take your group to the top of the hill behind the largest stone hut to investigate the smoke. In the distance you see a group of about 40 figures gathered around a smoky fire.

Your captian has offered a bonus of $100 to the person who first sees any one of the missing explorers. You would each like the honor of being the first to see them--if they are there. But at the same time you are careful, because these figures around the fire may be dangerous. There are several pairs of field glasses in the group. The sun is still shining brightly. With field glasses one can count the logs on the fire.

32. A. The mechanic, looking through his field glasses, says, "They are tan-skinned creatures with furry spots."

B. The anthropologist, looking through his field glasses, says, "They don't have furry spots. They are wearing skins of animals."

C. Equally reliable or unreliable.

33. A. The mechanic says, "I think there are 40 of them."

B. The anthropologist says, "No, I think there are only 37."

C. Equally reliable or unreliable.

34. A. The anthropologist exclaims, "That's Captain Sardus there on the left by himself!"

B. The mechanic reports, "That's Sergeant Edema who just stood up on the right."

C. Equally reliable or unreliable.

Go on to the next page.

Reminder--mark as follows:

A. The *first* is more reliable.
B. The *second* is more reliable.
C. They are equally reliable or unreliable.

35. A. You borrow the anthropologist's glasses and say, "Yes, *that's Sergeant Edema*!"

B. At the same time, the health officer, who has borrowed the mechanic's glasses, says, "Yes, *that's Sergeant Edema*!"

C. Equally reliable or unreliable.

Now the question is whether the man on the left is Captain Sardus. If so, then the reward goes to the anthropologist. If not, it goes to the mechanic.

36. A. The health officer then looks through his field glasses at the one of the left. "*That's not Captain Sardus*," he says.

B. The anthropologist, who has his glasses again, replies, "*Yes, it is*."

C. Equally reliable or unreliable.

Then the man at the left rejoins the group of figures and another person takes his place.

37. A. The health officer says, "*That new one is not one of the fourteen explorers*."

B. The anthropologist agrees, "*You're right, he's not*."

C. Equally reliable or unreliable.

38. A. The anthropologist continues, "And look! There's Captain Sardus facing our way with his hand over his eyes. *That's the same person as the one I called Captain Sardus before*. I've been following him."

B. The health officer says, "Yes, that's Captain Sardus facing us now. But *he's not the one who was over there on the left*. That one is sitting down with his back to us. I've been following him, too."

C. Equally reliable or unreliable.

Go on to the next page.

You ask them to see if they can agree on the number of beings in the group so that you can give an accurate report.

39. A. The health officer has had practice counting large numbers of objects on microscope slides. He announces, "There are exactly 39 figures in that group."

B. One soldier says, "No, there are 38."

C. Equally reliable or unreliable.

Reminder--mark as follows:

A. The first is more reliable.
B. The second is more reliable.
C. They are equally reliable or unreliable.

40. A. The mechanic takes his glasses back from the health officer and makes a count. "Yes, there are 39 of them," he says.

B. The soldier repeats, "There are only 38."

C. Equally reliable or unreliable.

The people around the fire get up and start toward the village. You quickly take your small party to a place on a nearby hill. There you can see the village without being seen. You want to find out whether this is a friendly village, whether the explorers are prisoners, and how many explorers are left.

The mechanic writes down what people say they see.

41. A. One soldier counts the people as they move around in the village and announces, "Only 32 came back from the fire."

B. Another soldier says, "You must have missed two. I counted as they filed past the big hut. 34 came back. None of them came back any other way, I believe.

C. Equally reliable or unreliable.

42. A. The anthropologist reports, "One of them had on a green hat when they returned from the fire. But he's the only one. I watched them carefully as they went by the big hut."

Go on to the next page.

B. The health officer says, "I think there are two with green hats. First I saw one on the left. Later I saw one way over on the right."

C. Equally reliable or unreliable.

43. A. A soldier says, "five times in the last minute the one in the green hat has talked to someone and pointed. Immediately that person has run off in the direction he pointed."

B. "He must be the leader," added the soldier.

C. Equally reliable or unreliable.

44. A. "Look, Captain Sardus and two other explorers are coming up to the one in the green hat, who is pointing to the big hut. The one in the green hat is ordering them to go in."

B. "Here come Sergeant Edema and one other explorer. The one in the green hat is pointing to the big hut. They're going in also," added the anthropologist.

C. Equally reliable or unreliable.

Reminder--mark as follows:

A. The first is more reliable.
B. The second is more reliable.
C. They are equally reliable or unreliable.

45. A. Several more groups of explorers enter the hut. The health officer asks the mechanic, who has been keeping a record, "How many do you think are in there now? I've told you each time one went in. I think there are 13."

B. The mechanic replies, "According to my record, there are 14."

C. Equally reliable or unreliable.

46. A. The anthropologist states, "That one with the green hat is going into the hut to the right of the big hut. Three others are following him in."

Go on to the next page.

B. The health officer says, "Look, here comes another with a green hat. So the one in there is not the leader, since there are two. Let's check the people who go into that hut."

C. Equally reliable or unreliable.

47. A. The anthropologist has been describing the people as they go in, trying to get some idea of what they might be like. He states, "18 people went into that hut."

B. The mechanic disagrees, "According to the record of what you have said, only 17 went in."

C. Equally reliable or unreliable.

48. A. The anthropologist then looks over to the large hut and says, "Do you see those two men? Perhaps they are sentries guarding the explorers. Oh, look! They're changing. The walking one stops about 15 feet from the door and then the one standing by the door walks over to him."

B. The health officer says, "Yes, I've watched them make ten changes now. But you have the order wrong. The man by the door leaves his post before the walking one reaches the point of change.

C. Equally reliable or unreliable.

49. A. The mechanic, who also has been watching, says, "I think the health officer is right."

B. The anthropologist says, "I think he's wrong."

C. Equally reliable or unreliable.

Reminder--mark as follows:

A. The first is more reliable.
B. The second is more reliable.
C. They are equally reliable or unreliable.

Go on to the next page.

50. A. One soldier says, "Oh, look at the tall sentry. He has an odd way of walking. He brings his left hand across almost to his right shoulder before his left foot touches the ground."

B. Another soldier replies, "It is odd. I've been watching him for about five minutes though, and you have the order reversed. He brings his left hand across after his left foot touches the ground."

C. Equally reliable or unreliable.

Go on to the next page.

Part II, Section A - What Can Be Done?

Your party discusses what can be done to rescue the explorers, and tries to reason things out.

For these last two sections of the test, it is all right to return to an item after you have left it.

In each of the items in this section, you must decide what follows from the reasoning. Do not judge whether the reasons are true. Just decide what would follow from them, if they were true.

Mark A, B, C, or leave it blank if you don't know. Consider each item by itself. Here is an example:

51. The mechanic says, "If these beings are people from earth, then they will welcome us. Certainly they are people from earth."

Which follows? Pick only one.

A. These beings will not welcome us.
B. These beings are not from earth.
C. These beings will welcome us.

Which did you mark? You should have marked C. Whether C is true or not, it follows from what the mechanic said. Go on to the rest. There is one best answer to each item.

52. "If these beings are from the earth, then another space ship must have landed here on Nicoma. These beings definitely are people from the earth."

Which one follows?

A. Another space ship has landed on Nicoma.
B. These beings are not from the earth.
C. Another space ship has not landed on Nicoma.

53. "If these beings are from the earth, then another space ship must have landed on Nicoma. But no other space ship has landed on Nicoma, in my opinion."

Which one follows?

A. Another space ship has landed on Nicoma.
B. These beings are not from the earth.
C. These beings came here by mistake.

Go on to the next page.

54. "Whenever sentries are used, two groups are unfriendly. Those two men are sentries."
Which one follows?
A. The two groups are friendly.
B. The two groups are unfriendly.
C. If groups are unfriendly, sentries are used.

55. "All earth people are able to talk. These are earth people."
Which one follows?
A. They are able to talk.
B. They are unable to talk.
C. If people are able to talk, they are from the earth.

56. "If a group of beings is approached in a friendly manner, the group will be friendly. This group of beings is not friendly to the explorers."
Which one follows?
A. The explorers approached them in a friendly manner.
B. The explorers did not approach them in a friendly manner.
C. This group of beings was unfriendly before the explorers approached them.

57. "If a group from earth lands on a planet, the landing is announced throughout the world in newspapers. No landing on Nicoma was announced, except for our landing and the landing of our explorers."
Which one follows?
A. If the newspapers announce a landing, then there has been a landing.
B. The group of beings is from the earth.
C. The group of beings is not from the earth.

58. "A group that is really unfriendly to outsiders will starve them. Our explorers certainly are not starved."
Which one follows?
A. Our explorers are really friendly.
B. The group of beings is really unfriendly to our explorers.
C. The group of beings is not really unfriendly to our explorers.

59. "This group is friendly to our explorers. If a group is friendly to another group of beings, it will not put them in prison."
Which one follows?
A. Our explorers were not put in prison.
B. Our explorers were put in prison.
C. Unfriendly groups try to put each other in prison.

Go on to the next page.

60. "There have been only two announcements of landings on Nicoma--our landing and the landing of our explorers. All landings on other planets of people from the earth are announced in the newspapers of the earth."

Which one follows?

A. The group of beings is not from the earth.
B. The group of beings is from the earth.
C. The newspapers never make mistakes.

61. "If a group is friendly to another group of beings, it will not put them in prison. A group that is not in prison would be out working on a day like this. Our explorers are not out working."

Which one follows?

A. The group is friendly to our explorers.
B. Unfriendly groups try to put each other in prison.
C. The group is unfriendly to our explorers.

62. "Look, one of our explorers climbed out a window and started to run away. He stopped running and put his hands up when a sentry aimed a rifle at him and shouted. A friendly group would let its guests leave."

Which one follows?

A. Unfriendly groups put their guests in prison.
B. This group of beings is very careful.
C. This group of beings is unfriendly.

63. "If we can talk to our explorers, we can find out for sure if these beings will make peace. We can talk to our explorers by sneaking in the back when the sentries change places."

Which one follows?

A. We can find out for sure if these beings will make peace.
B. We can not find out for sure if these beings will make peace.
C. We can not sneak in the back if the sentries are very careful.

64. "If they are from the earth, they are well-armed. If they are well-armed, they must be taken by surprise. They obviously are from the earth."

Which one follows?

A. They are poorly armed.
B. They can be approached in peace.
C. We must surprise them.

Go on to the next page.

65. "If we attack them, we will kill some. If we kill some, we will lose information about Nicoma. Now we must not lose any information about Nicoma."

Which one follows?

A. We must attack.
B. We must kill some of them.
C. We must not attack.

Go on to the next page.

Part II, Section B - Reporting Back and Deciding What to Do

After watching the village for about an hour, you lead your party back to the main camp. You report to your leader. In making your report, you take certain things for granted. These things fill the gap in your reasoning. Here is an example:

66. "The explorers can't escape, because they can't break down the walls of the stone hut."

Which is taken for granted?

A. The explorers can jump out the window.
B. The guards are alert.
C. All ways of escape, except through the walls, are impossible.

What is the answer? The answer is C. It would fill the gap in the reasoning. A and B would not fill the gap. Mark C for number 66. There is one best answer to each of the following items.

67. "Since our explorers are prisoners, we can not talk to them without being discovered."

Which is taken for granted?

A. In general prisoners can not be talked to, unless their guards know about it.
B. In general, if we talk to people, they will tell others about it.
C. In general, if we talk to people, they will not tell others about it.

68. "If we talk reasonably to those people, they'll release our explorers. After all, those people are human beings and the release of our explorers would help humanity."

Which is taken for granted?

A. When you talk reasonably to human beings, they will act in a way to help humanity.
B. Anything that human beings do is intended to help humanity.
C. You have to talk reasonably to human beings in order to get them to do something.

69. "The shorter of the two people wearing green hats is a female. I know because I saw her long hair when she removed her hat."

Which is taken for granted?

A. All females have long hair.
B. Only females have long hair.
C. A person wearing a green hat is likely to be a female.

Go on to the next page.

70. "Since about half of the villagers had very short hair, I think that at least half are male."
Which is taken for granted?
A. Half are female.
B. All males have short hair.
C. Only males have short hair.

71. "If at least half of them are men, then in a fight we will have to fight at least half of them."
Which is taken for granted?
A. Women are not fighters.
B. Men are fighters.
C. We can not beat them all, if they are all fighters.

72. "We need not worry about more than 10 of them at a time, since there are only 10 guns."
Which is taken for granted?
A. Guns can hurt us.
B. Knives can not hurt us.
C. Only guns can hurt us.

73. "They have only 10 guns. I know because each sentry had one gun and 8 guns were stacked in the middle of the village. That's all that could be seen."
Which is taken for granted?
A. All guns that they have are in plain sight.
B. They do not carry guns under their animal skins.
C. Guns are their only weapons.

74. "The villagers did not have any scouts out. This I can tell because we saw none, and we looked carefully."
Which is taken for granted?
A. Scouts are used only by people who want somebody to investigate for them.
B. Scouts show themselves to people who are alert for them.
C. If you see a scout, then he has been careless.

75. "The villagers must not know of our presence, since there are no scouts out watching us."
Which is taken for granted?
A. If a group knows of the presence of another group which is possibly unfriendly, the group will have scouts out watching the other group.
B. If there are scouts out watching, then the group from which they come knows of the presence of another group.
C. If a village sends out scouts, the villagers suspect trouble.

Go on to the next page.

76. "The villagers are not from the United States, because we have not heard of any other landings on Nicoma by people from the United States."

Which is taken for granted?

A. All landings on planets are announced.

B. All landings by United States people on planets are announced to other explorers from the United States.

C. Explorers from the United States do not hear of landings by explorers from other countries.

END OF TEST. If you have time, you may go back and check over your answers, but only in the last two sections (Items 51 to 76). Do not guess wildly. Answer a question if you *think* you know the answer, but are not sure.

Here's the rest of the story: The explorers prepared for an attack and sent a truce party to talk to the villagers. The villagers, who came by mistake to Nicoma in a space ship from the earth, made peace.

APPENDIX D

KANSAS STATE TEACHERS COLLEGE
of Emporia
International Relations Research Project

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INTERNATIONAL RELATIONS ATTITUDE SURVEY

DIRECTIONS: Following is a number of statements concerning international affairs and the position of the United States in reference to selected aspects of its foreign policy. If you STRONGLY AGREE with the statement, mark an "X" on the answer sheet in the box labelled SA; if you AGREE, but do not feel too strongly about the statement, place the "X" in the box labelled A; if you are UNDECIDED, place the "X" in the box labelled U; if you DISAGREE, but not strongly, mark an "X" in the box labelled D; and if you DISAGREE STRONGLY, place the "X" in the box labelled DS.

EXAMPLE.

> "Most people agree that a high school education is highly desirable."

SA X	A	U	D	DS

The questions are numbered from 1 through 31. Please answer all questions.

1. Generally speaking governmental decision-making on foreign affairs is an extremely complex process.
2. The United States has no foreign policy.
3. The United States has little need to concern itself with the political stability of the underdeveloped nations.
4. The eventual success of a world government is closely related to the further development of international law.
5. A democratic nation should always follow democratic principles in determining and carrying out its foreign policy.
6. Accurate information is a necessity for good foreign policy decisions.

7. Alliances with other nations are only a hindrance to the United States and should be abandoned.

8. Non-communist nations other than the United States have the right to independent and even neutral cold war foreign policies.

9. International events are not important enough and will not affect the average citizen enough for him to be concerned.

10. Whichever country or alliance that has the balance of power is able to dictate the actions of the rest of the world.

11. The United States should always try to do the "right" thing in international relations even though this course of action may not always be popular with our allies.

12. Democratic principles always provide sufficient guidelines for making foreign policy decisions.

13. In making United States foreign policy it does not make any significant difference whether the public is informed or not.

14. Congress should enter into the foreign policy-making process and share with the President the power to make foreign policy decisions as much as is Constitutionally possible.

15. The economic condition and growth of any country is very important in determining its general foreign policy.

16. The "time lag" between investment in military research and the use of the weapons developed is sometimes important in the success of a country's foreign policy.

17. The public should be informed and be allowed to participate in every major step in making foreign policy decisions.

18. The United States should not concern itself with power interests and imperialism but with principles of ethics in making foreign policy.

19. Newspapers should be responsible and honest in reporting foreign policy events because their reporting affects foreign policy decisions.

20. So many factors must be taken into account in making major foreign policy decisions that all of the factors can never be fully understood and evaluated.

21. The United States should always follow democratic principles in determining and carrying out its foreign policy.

22. Since delay can possibly jeopardize our national security, the President should not be required to consult with members of Congress before he makes important decisions.

23. There is little reason for the average citizen to be informed about world affairs since ultimate decisions are made by a few men in Washington.

24. If a Congressman disagrees with his constituents about a particular issue, he should vote according to the dictates of his own conscience.

25. The government is not justified in withholding information from the public.

26. Since our foreign aid program is largely military in nature, we should not delude ourselves into thinking that we give aid for any reason other than to protect our national security.

27. It is more important to protect our domestic industries than it is to help foreign countries develop industries.

28. We should discontinue giving military assistance to dictatorships, for in so doing we increase the ability of the dictator to oppress his own people.

29. The basic cause for all of our international troubles is Communism.

30. Ideological goals are secondary to those of national interest and should be considered only if they do not conflict with security and welfare goals.

31. If we really believed in world peace, we would work toward the formation of a world government.